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Contributions

Reconstruction of the Union Pacific.

Union Pacific Railroad Company,
Laramie, Wyo., April 3, 1901.

To the Editor of the Railroad Gazette:

I notice in your issue of March 15, 1901, page 186, an article appears on the "Reconstruction of the Union Pacific," by J. I. Boggs, in which he says (referring to me): "Under his able supervision the preliminary location was so altered as to reduce the length of the tunnel to 1,800 ft. instead of 3,400 ft. He also made other modifications which reduced the cost materially."

I wish to state that the change in location at the tunnel and the revision of every other part of the line, was directed by the Chief Engineer, Mr. J. B. Berry, before I went on the ground or knew anything about the local conditions. The length of the tunnel was also decided by the Chief Engineer, and no credit is due to me whatever for any changes or modifications. All credit is due Mr. Berry and his principal assistant, Mr. Huntly.

Mr. Boggs says that he had poor instruments; if he did have, it was his own fault.

D. C. Dunlap, Resident Engineer.

Telephones in Train Despatching.

New York Central & Hudson River Railroad
Albany, N. Y., March 21, 1901.

To the Editor of the Railroad Gazette:

I have read your editorial of March 15 on telephones in train despatching and other railroad work. The many advantages derived from the quick communication afforded by the telephone between officers of the railroad and their subordinates in any place where there are many offices receiving orders from the central, or division office, are apparent. The advantages of the telephone in despatching trains you summarize at the end of your editorial as follows:

1. It makes available as an operator every station and train employee who is good at reading and writing.
2. As a corollary to this, makes it much easier to promptly fill vacancies.
3. A slight saving in time.
4. Perhaps a saving in wages.
5. Enables the despatcher to make sure that both conductor and engineman have read an order.

On looking over these advantages claimed for the telephone a few questions arise. Does the superintendent of a division want every station or train employee, who is good at reading and writing, to have the right to receive a train order over a telephone? It would seem that under this condition of affairs the responsibility of the order being correctly received, and in turn delivered to those for whom it is intended, would be too widely distributed. Isn't there a decided advantage in having one man at a station responsible for orders being correctly taken from the wire and in turn handed to the proper persons? In case of mistakes in receiving orders or delivering them, the fixing of responsibility would be difficult. The train employee at the present time is burdened with enough responsibility without adding this of receiving and writing out train orders at places where his mind and attention is necessarily called to other work.

2. It does not appear that at the present time there is any difficulty in obtaining telegraphers, as was shown by the recent success of a Western road in gathering a number of extra men when a strike was threatened in this branch of the service.

3. The saving of time would occur but very seldom, and the advantage claimed under this head would be counterbalanced by the irritation which you speak of in your editorial, due to the tendency of the sender to speak the order faster than the receiver could write it down.

4. At the greater number of stations along the line of a railroad the operator has many duties to perform other than receiving train orders. These other duties would still have to be attended to by a representative of the company, whether or not he was an operator. Under the present prevailing scale of wages, it is hard to see how a less amount could be paid for the responsible and intelligent service demanded by the duties of an agent, whether operator or not.

5. How will the despatcher be sure that both the conductor and engineman have read an order? Is it possible for despatchers working different tricks to recognize over the telephone wire the voices of several hundred employees, conductors and enginemen, on the division of a railroad? This might be true if there were but few changes in the men on a division, or if the voices of the men sounded always the same over the telephone; but both of these suppositions are contrary to facts.

F. M. D.

The 100 Per Cent. Rail Joint.

Altoona, Pa., April 8, 1901.

To the Editor of the Railroad Gazette.

Mr. Alfred P. Boller in his letter entitled "The Rail Joint Devil," published in your issue of the 5th inst., gives us some very interesting reading, and he evidently views the subject through the trained eye of an Engineer. The weak joint certainly has been haunting our railroad people in a fiendish way. The problem is beset with so many difficulties and involves so many indeterminate quantities that perhaps not more than one in a thousand has the courage to grapple with it. I, like the others, would have avoided it, if it had not lain in the direct line of duty.

Mr. Boller thinks that Mr. Thomson must admit that Mr. Bonzano has "seen him and gone him one better." We who live in the busy railroad town of Altoona are not supposed to know what that expression means, but it is doubtless intended to convey the supposition that Mr. Bonzano followed after in the respect of time and was able to make some marked improvements.

The characteristic features of the Bonzano splice are that the depending flange is in perpendicular position, that it has wide flanges or lugs extending out on top of the ties, and that these perpendicular and horizontal flanges are connected up with gussets. That such an arrangement of parts is the best, or that the employment of metal therein is the most efficient and economical I do not feel prepared to admit. It is found practicable to do better work with a weight of metal at least 15 per cent. less.

The task set in designing our "100 Per Cent. Joint" was not only to secure a structure that had the full strength of the rail, but, at the same time, to distribute the material in the most economical way, and I am obliged to confess here that in the parlance of Mr. Boller I saw my antagonist's "hand" before I "played." Mr. Bonzano, if reports are correct, shaped up the splice that now bears his name in latter part of 1896 or first part of 1897. Mr. Louis H. Barker, our Principal Assistant Engineer at Jersey City, seems to have conceived the same idea a year or more earlier, and I have on my file his letter to me of Aug. 30, 1895, in which he gives a pen-and-ink drawing of the Bonzano splice as it is made to-day, and the text describes clearly how it could be forged or pressed into finished shape. It frequently happens that two persons strike upon the same invention at times not far apart.

It, therefore, appears that when our first pattern of "100 Per Cent." splice was worked up in latter part of 1895, the Bonzano, or Barker, form was held in full view as a possibility, and received the most careful consideration.

It was plain enough that by extending reinforcing flanges down between the joint ties the carrying capacity could be run up to 100 per cent. or beyond (*ad libitum*); and when we came to locating these flanges it was equally evident that, if an angle of about 45 deg. was used three distinct advantages would be secured; first, the vertical axis of the deepened girder would be kept within the vertical surface that is gripped by the bolts, and an increase of cross-strain on the bolts would thus be avoided; second, a desirable measure of elasticity would be retained, and third, the flanges would be out of the way of tamping. We find that these advantages materialize in practice, and from the manufacturing standpoint the design is proving a very happy one.

The length of this depending flange was not so much of a problem, though it does seem to disturb Mr. Boller a little. It is found by tests running up to 300,000 lbs. (a destructive load) that the ends of the splice bars are so supplmented by the full strength of the rails to which they are bolted that the severe strains are confined to a 3-in. space at the middle of the bars; so, when we give the flanges a length of 10 in. the critical space is amply covered.

As regards the "increased tie support," allow me to say that our first pattern of the "100 Per Cent." did have wide flanges spreading out on the ties, and they were double-spiked like the Bonzano. Of that pattern we put in 30 miles in 1896 and 30 miles in 1897. Many of these are still in track and are giving good service, but as early as March, 1897, some of us, who watched the experiment closely, were satisfied that it would be better to shear the flanges or lugs entirely off on line an eighth of an inch above the tie, and if more bearing should be desired with soft-wood ties it could be better obtained by using a tie-plate extending under the base of the rail. Our plan was therefore revised on that basis in early part of 1898, and all that we have put in since that time are minus the tie flanges. Shearing these flanges off imparts to the ends of the bars a certain degree of pliability that is very desirable, and the metal had better be left at the mill as scrap. The results are up to this time very gratifying, and with this record before him the thoughtful reader can judge which of the two parties is moving in advance. Whether either of us has fully attained the desired end, or whether either type is the *ne plus ultra* is perhaps not for me to say, but it is sure to be determined in track, and that very shortly. It has been demonstrated already that a very great gain has been secured.

That the bridge engineers of some eminence, as also others not directly connected with track maintenance, are giving the subject much attention and are doing what they can to emphasize the serious defect in our rail structure cannot but redound to the profit of all concerned.

Just how far each pair of splices should be regarded as a "little bridge" extending over two ties is a question that is still somewhat open. When we spike a joint with undue firmness to the two joint ties and then watch the two ties move up and down in the ballast in obedience to the action of the wave that is much longer, and our abutments thus come to have so little of permanence, it seems quite probable, at least to some of us, that it is better practice to splice the rail ends up to full strength without so much reference to the two ties immediately under them, and then make the spiking, lateral stiffness, etc., at the joint as nearly as possible the same as elsewhere along the rail. It may be that in no other way can we get the perfection of line and surface that is now so strenuously demanded. Perfect surface means, of course, least possible wear. After that comes the great saving in track labor, which, I feel satisfied, Mr. Boller in no respect overdraws. If in these days of heavy equipment and loads we are offering a splice-bar that fully meets the need, we can safely possess our souls in patience, for the times are more prosperous now, and the managing officers are sure to want what is best. As regards the relative merits of the two joints that are now being considered, it may be that Mr. Boller, with his keen engineering instinct, does know right now which of the two is superior, but it might be well to remember that "he laughs best who laughs last."

M. W. Thomson.

Switching by Initials.

At a recent meeting of the St. Louis Railway Club this question was introduced: "What can be done to reduce expenses of switching, especially at large terminals of cars, by initials? Also, handling empty cars of same size and capacity over same ground in opposite directions, account of initials?" To this Mr. Cavanaugh, of the Big Four, replied:

"No one who has traveled around the country and has been observing could avoid noticing the movement in opposite directions of empty freight cars of similar class, size and capacity. This is caused by the present method of handling of cars by initials, marking or ownership. It is one of the principal causes for such small earnings in car mileage of railway equipment; also, large empty mileage on some lines. Such handling also increases the expense of switching at large terminals and at storage points. Increased switching means more expense in wear and tear on track and equipment. Under existing custom foreign cars must arbitrarily be moved toward home, so that in many cases we see cars of similar size and class moving in opposite directions, account of home movement.

"The Big Four, for example, receives a large volume of business, such as coal, coke and high class merchandise, from the C. & O. at Cincinnati for Chicago; there being no return C. & O. loading, these cars are on hand empty at Kankakee, where the business is all for Cleveland and Eastern lines. The Big Four receives a large west-bound high class merchandise and hard coal loading at Cleveland for East St. Louis in Eastern line cars; there is no Eastern business in sight, but a large amount of C. & O. business. We are thus confronted with the situation of having C. & O. cars at Kankakee, 300 miles from points where cars are needed for 'home' loading; while at St. Louis we have the Eastern line cars and the Eastern loading 250 to 300 miles off, thus forcing us to exchange the empties by a long haul in opposite directions over the same track. Why not load the C. & O. cars East and the Eastern cars C. & O.? Imagine, if you can, similar conditions in banking business. A would loan B five silver dollars and demand the individual dollars returned in payment of the loan.

"It has been suggested by some in the case above cited that we load the C. & O. cars to Indianapolis and the Eastern cars to same point and transfer. This takes track room, switching, cost of transfer, wear and tear on tracks, power and equipment, and retards the

movement of the traffic and the cars, making a maximum service impossible under such conditions.

"In 1895 and 1896 I took a great deal of time to study the loss to roads or car owners caused by cars being stopped at junction or transfer points for transfer, account of owners or others not wishing cars to go beyond such points. From the best information and a very conservative figuring it must amount to over $25,000,000 per annum for the entire country; and these figures do not include anything for foreign and empty mileage, increased repairs, etc. Some of your readers can, no doubt, recall cases where they rode local and saw the crew get an order to pick up a designated car at some out-of-the-way gravel pit or storage track. After switching from one to two hours they finally dug out the required car, whereas the first car on the track was the same size, capacity, etc., as the one called for, but of different initials or ownership.

"The exchange plan of car for car or pooling of freight cars will bring about an improvement or relief from present car shortages. There are more freight cars in the country to-day than necessary to take care of the business, if handled under proper methods. No plan will succeed unless based on the owner and user participating in the profit or loss in car movements."

Drop-Bottom Gondola Cars of the Atchison, Topeka & Santa Fe.

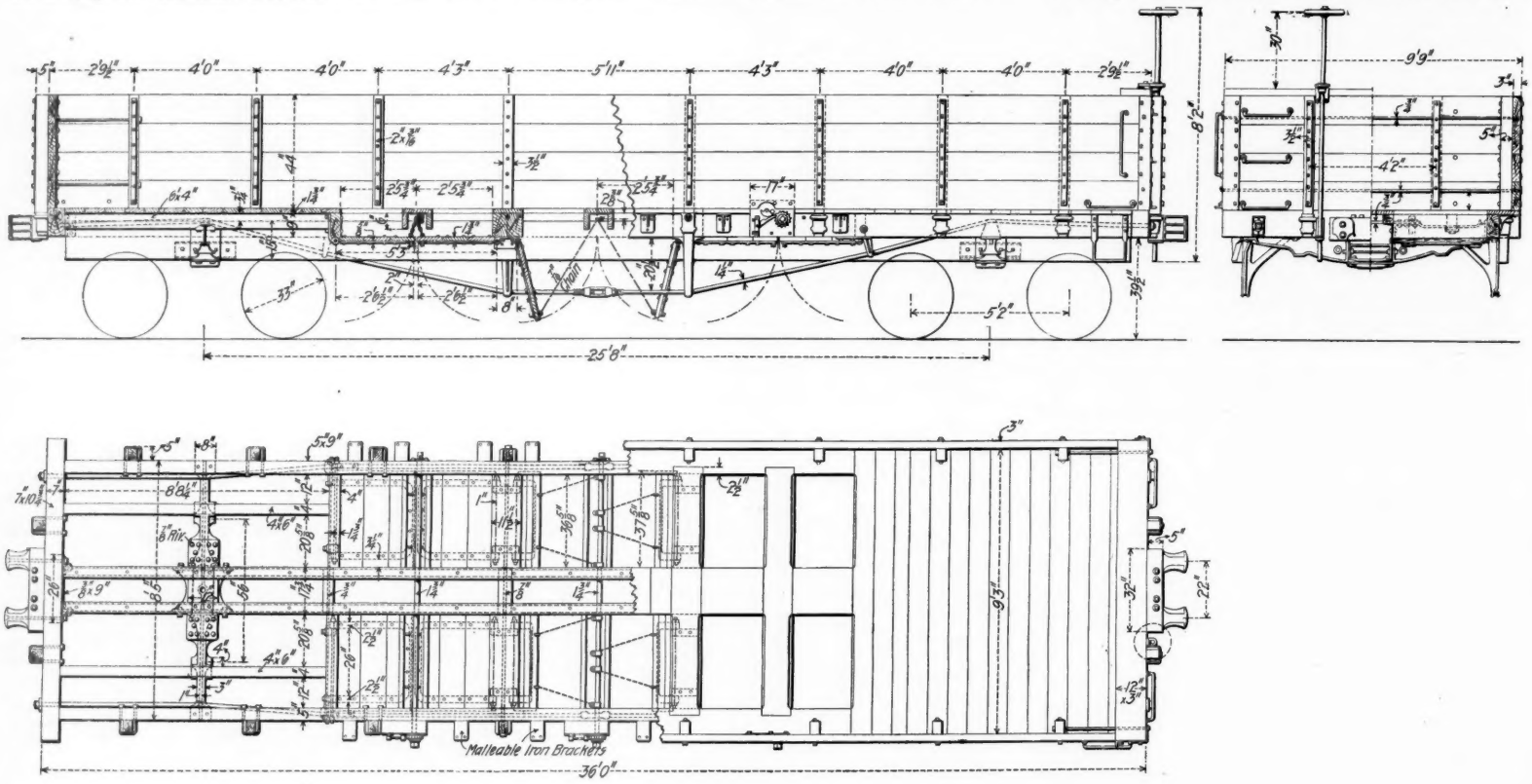
There are now building for the Atchison, Topeka & Santa Fe some drop-bottom gondola cars with steel center sills, which are shown by the accompanying engravings. These cars are of 80,000 lbs. capacity and 36 ft. long over end sills. The length inside is 35 ft. 6 in., the width inside is 9 ft 3. in. and the sides are 44 in. high. Three sets of drop doors are provided which enable about 62 per cent. of the load to be dropped through the bottom without shoveling.

The center sills are two 15-in. steel channels with the flanges turned in, above which are nailing strips. The side sills are 5 x 9 in. timbers, and wooden intermediate sills, 4 x 6 in., extend from the ends of the car to the cross pieces at the doors. It will be seen that the heavy crossties at the ends of the middle openings are directly above the posts of the trusses. The side sills only are trussed. The end sills are 7 in. wide and 10¾ in. deep, which permits the draft rigging to be placed between, and to be attached direct to the center sills without cutting out the end sill. Malleable iron buffer blocks are used. The side and end planks are 3 in. thick and are supported by outside stakes and stake pockets. The flooring is 1¾ in. thick.

There are three sets of drop doors on either side of the center sills and these doors are not flush but are hung 9 in. below the floor. They are operated by chains and ratchets and form 12 clear openings in the floor a little more than 2 ft. x 3 ft. each.

The body bolsters are of an unusual design. Each bolster consists of two malleable iron arms extending outward from the center sills, these arms being riveted to the webs of the sills and tied together at the top by a ¾-in. cover plate. This cover plate is riveted to both arms of the body bolster and also to the top flanges of the center channels. "Player" trucks are used under these cars, these trucks having cast-steel body bolsters and transoms, and ordinary arch bars.

We are indebted to Mr. R. P. C. Sanderson and Mr. Edward Grafstrom for the drawings of these cars.



Drop-Bottom Gondola Car with Steel Channel Center Sills—Atchison, Topeka & Santa Fe Ry.

A Fortified Nicaragua Canal.

Col. Peter C. Hains, Corps of Engineers, U. S. A., recently made an address on the Nicaragua Canal before the American Academy of Political and Social Science. His professional knowledge and his experience as a Commissioner of the United States to report on the Isthmian Canals, make his opinions of special value. The paragraphs which follow are from newspaper reports and perhaps are not quite correct in arrangement or language, but they give the essential thought.

It is safe to conclude that in a war between the United States and a nation of inferior naval power the canal would be of no value to an enemy under any circumstances, while a neutral canal would be as serviceable to the United States as one thoroughly fortified.

The nations that are approximately equal to the United States in naval strength are Russia, Germany and Italy. The first of these has a navy about 25 per cent. larger than that of the United States. But Russia is so situated geographically that operations against this country could be carried on only at a disadvantage. She has a position at Vladivostock which is reported as being strongly fortified. It lies uncomfortably close to the Philippine Islands, which are far removed from the support of the United States. To reach the Philippines and American commerce in the Pacific the Suez route is for Russia shorter, better, and less liable to interruptions than one via an American isthmian canal.

The geographical position of Italy is not good for conducting hostile operations against the United States. . . . If Italy should make a demonstration against this country in the Pacific it would be in extreme western waters in the vicinity of the Philippine Islands, and for this purpose the Suez route is the shorter and better way.

Germany and the United States are more nearly on an equality in naval strength than any other two important naval powers. But Germany has no colonies or supply stations on the Atlantic side of the United States; her nearest colony is in Africa, too far removed to be of much use in a war with the United States even if it were otherwise advantageous. On the Pacific side Germany has supply stations, but they are few and far from the shores of the United States; but to attack this country on that side Germany would not use an American isthmian canal. The Suez route is better and less liable to be interrupted.

In a war, then, between the United States and any nation of approximately equal naval strength, the canal would not be used by the enemy, while a neutral canal would be used by the United States.

There are only two nations whose naval strength is decidedly superior to the United States; these are France and Great Britain. The total naval tonnage of the former is nearly double that of this country, but much of it is in vessels of an old type. Fort de France, on the Island of Martinique, one of the Windward Islands on the east side of the Carribean Sea, is a commodious deep-water harbor. It affords a fine rendezvous for a French fleet within striking distance of the canal.

If the canal were fortified France, under the laws of war, would have the right to capture, destroy or blockade it. But naval control of the Caribbean Sea would be necessary to capture or blockade it. Whether or not France would wish to do either would depend on circumstances. If she did, a struggle would take place for naval supremacy in the Caribbean Sea, after which, if successful, the canal could be blockaded. But if the canal were neutral, France, without a violation of the laws of war, could neither blockade, destroy, nor capture it. She would, therefore, have less reason to strive for supremacy in the Caribbean Sea and the United States would get the full use of the canal without the necessity of fortifying it.

Great Britain is a commercial nation. Her foremost object would be in the event of war to keep open her avenues of trade. In a war with the United States, her first aggressive operations would doubtless be on the Atlantic side, for which Great Britain is well provided with good bases in close proximity to our shore. These stations form a cordon around the American coast which would menace the operations of the United States navy, and from which Great Britain would operate against coastwise commerce at her leisure.

If the canal were fortified a garrison would be stationed there. To keep open communication between it and the United States would become a matter of the most vital concern. To destroy these communications would, therefore, be an object of the highest importance to Great Britain. With five battleships to America's one, and with Kingston, a deep, well-fortified and commodious harbor, as a base of operations, Great Britain would have every chance in her favor.

No prudent naval commander would hold a fleet in Lake Nicaragua or Lake Bohia to spring out on the foe in either ocean, as has sometimes been suggested. If our enemy be weak, it would not be necessary; if strong, the dangers of being bottled up are too great. No chain is stronger than its weakest link; the weak link in a war with a stronger naval power than ourselves is on either side. Munitions of war and troops would ordinarily be transported across the continent by rail, as that is a more expeditious route. As a line of communication it is badly located when considered in a war with a superior naval power. Instead of being in a protected position behind the main line of defence, it is out beyond the skirmish line. An adequate defence of a fortified isthmian canal can be made in no other way than by providing a navy of sufficient power to control the seas at either terminus. With such a navy at our command the canal needs no fortifications.

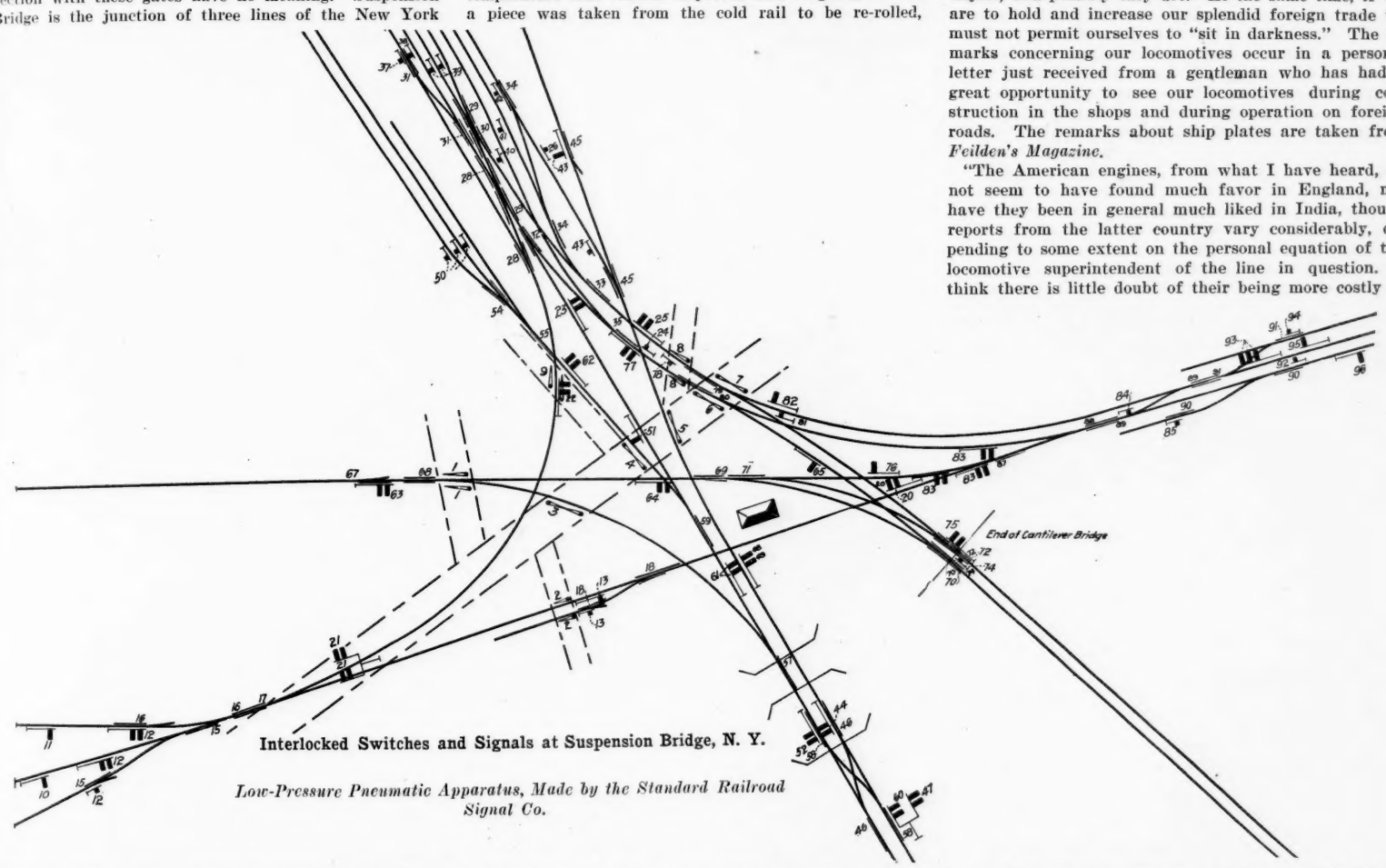
From a military standpoint the canal is of more value to the United States than to any other nation. To keep it and the approaches open at all times would, therefore, be the aim of our government. But no amount of fortifications along the line of the canal will afford safe passage to a ship across the Caribbean Sea.

It is believed, in consideration of the freedom of the canal extended by the United States to the ships of all nations, those nations would agree to an arrangement by which the region of the canal and large areas of the sea at each terminus should be exempted from the operations of war. The larger these areas of neutrality the better. But in view of the benefits to mankind which the United States would confer by the construction of the canal, there ought to be no serious difficulty in securing areas of the sea bounded by arcs of circles described with radii of, say, 100 miles or more. Should such an agreement be violated by any nation that is a party to it, the United States could destroy the canal if necessary, so as to render it impossible of being used against us. As no nation

except Great Britain would wish to use the canal for any other than peaceful purposes of commerce, and as she probably would have no strong reason for using it in any other way, it is not seen why such an agreement might not be made. How such a status of the canal and adjacent waters can be effected are matters for statecraft to settle. The object of the foregoing remarks is to endeavor to show that a neutral canal, with a large area of neutral waters at each terminus, is, in the existing status of the naval powers of the world, a more useful canal to the United States from a military standpoint, than one that is controlled by military power.

Pneumatic Interlocking at Suspension Bridge, N. Y.

The New York Central & Hudson River has lately put in service at Suspension Bridge, N. Y., at the eastern end of the bridges crossing the Niagara River, a low-pressure pneumatic interlocking machine, made by the Standard Railroad Signal Company, of Troy, N. Y. The arrangement of the tracks, in which, however, there have been a few slight changes since the engraving was made, is shown in the accompanying cut. The machine has 82 working levers and six spare spaces. It was at first intended that the highway crossing gates shown in the drawing should be operated from the signal cabin, but this plan was abandoned and the numbers shown in connection with these gates have no meaning. Suspension Bridge is the junction of three lines of the New York



Interlocked Switches and Signals at Suspension Bridge, N. Y.

Low-Pressure Pneumatic Apparatus, Made by the Standard Railroad Signal Co.

Central & Hudson River Railroad (from Buffalo, from Rochester and from Lewiston); and the main line of the Michigan Central, the Erie and the Lehigh Valley roads.

The pneumatic apparatus was described in the *Railroad Gazette* March 22, 1901, and also on May 25, 1900.

Notes on the Manufacture of Rails.

BY MR. W. R. WEBSTER.

[In our issue of March 29 appeared an abstract of the report of the Maintenance of Way Association Committee on Rails, with portions of the discussion. Mr. Webster's discussion has been held to appear as a separate article and is given below in full.]

At the first Annual Convention of this Association, Mr. Reed's description of the old and present methods of manufacturing steel rails was given, with his deductions. He referred to the outraged and crushed particles in the steel not being allowed to come to rest at any time during the present method of manufacture and further said: "Owing to all this haste the rails finish at a high temperature, and the heads practically anneal and soften themselves on the cooling beds, but the annealing is useless and too late as the mass of metal in the heads is, of course, open, friable grain and poorly fitted to stand the abrasive action of the car wheels under heavy loads."

This is not annealing. It is only slow cooling and tends to increase the size of the grain in the rail that has been finished too hot in rolling. It has been shown time and again that to anneal steel it must be allowed to cool down below the point of recalescence and then heated up to the proper temperature above that point. Simple as this fact is, it has often been overlooked, and a few years ago it was common practice to pile very heavy plates one on top of the other, as they came from the rolls, in order that they would hold the heat and thus be annealed. It has been proved that this delayed cooling made the plates much worse than they otherwise would have been. But on the other hand, that by holding the plates back in rolling, in order to finish at a lower temperature they were very much better. Intentionally, in this case, the "particles were outraged and crushed," at a proper temperature of course, and thus drawn out, producing a very superior plate. Recent practice has shown that the same improvements are produced in rails by this delayed rolling.

Another important matter is to have a satisfactory check on the finishing temperature of the rails. It is not of much use to say that the rails must be finished at a dull red or any other particular color, as opinions differ as to just what a dull red is, and in the daytime it certainly looks very different than at night. The best check we have is a simple one that I have advocated for some time, that is, the amount of shrinkage that takes place in a 30-ft. rail from the time it is cut at the hot saw until it reaches the normal temperature. Just how many inches it is proper to allow could be easily decided by experiment, and introduced into the specifications.

It has been said that the "only way to get a satisfactory rail is to re-roll it." The heating of the cold rail to the low heat required for the slight reductions in re-rolling, anneals it, and the work of rolling at this low temperature still further improves and toughens it. If a piece was taken from the cold rail to be re-rolled, another from the rail after it has been heated, and a third from the re-rolled rail, these pieces when broken under the drop would show the improvements in the structure referred to. The ordinary method of rolling with the proper amount of work on rails at a low enough temperature will produce just as good rails as by re-rolling; but on account of the flanges losing the heat so much sooner than the head it is difficult to do this, particularly with the heavy sections. In order to overcome this difficulty and finish the rails at the proper temperature, Mr. John Fritz suggested some years ago taking the rails before the final passes and putting them in a furnace that was kept at a low heat. This would allow the heads to cool down and heat the flange up to the proper temperature. The condition of the rolling in the final passes would be the same as in the re-rolling, except that the slow cooling of the heads in the furnace would make a much larger grain, at the same temperature, than the cold rails that had been heated up to this low temperature. Therefore more work would be required in the last passes to produce the same results in the finished rails.

The Carnegie Steel Co. have, at considerable expense, changed the position of the finishing rolls at the Edgar Thomson Mills in order to hold the rails back before the last pass. The rails are so arranged on the skids that the head of one rail is kept in contact, or close to, the flange of the rail next to it. This keeps the flanges hot while the heads are cooling down, and much better results are obtained than in their ordinary method of rolling. But in any of these methods of rolling the thin flange is the troublesome feature. This can be overcome to a large extent by putting more metal in the flanges of the heavier sections, in order to carry the heat longer and allow the work of rolling on the head at a low enough temperature to produce the tough, good wearing steel of the old, lighter section rails.

What has been said indicates some of the troubles to be encountered in this problem. In addition to these we have, of course, the effect of the chemical composition on the finished rails. There are yet wide differences of opinion as to where to draw the limits for almost any of the elements, and the composition that may give the best results with the present methods may have to be modified for rails finished in rolling at a lower temperature. From statements made there seems to be something wanting in the present specifications in connection with the present methods of rolling, and in this respect they resemble Col. Mulberry Sellers' celebrated eye-water, its features being the "lacking ingredient," and "the more you use the more you need."

In my business with railmakers, as an inspector of rails, I have not found them as arbitrary as stated. In many cases on foreign specifications for rails they have met requirements of specifications much more severe than any American engineer has called for.

Some English Criticism of American Wares.

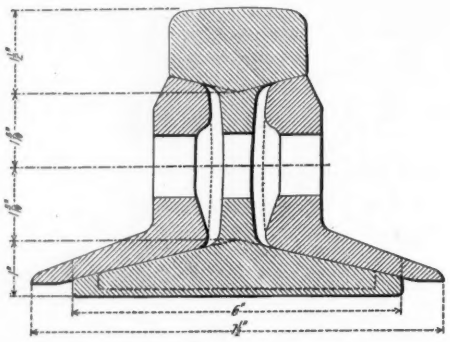
Below will be found two criticisms of certain American product recently sent abroad. Of course, we must suppose that the manufacturers who have supplied the articles mentioned will assume that the criticisms are unjust, and possibly they are. At the same time, if we are to hold and increase our splendid foreign trade we must not permit ourselves to "sit in darkness." The remarks concerning our locomotives occur in a personal letter just received from a gentleman who has had a great opportunity to see our locomotives during construction in the shops and during operation on foreign roads. The remarks about ship plates are taken from *Feilden's Magazine*.

"The American engines, from what I have heard, do not seem to have found much favor in England, nor have they been in general much liked in India, though reports from the latter country vary considerably, depending to some extent on the personal equation of the locomotive superintendent of the line in question. I think there is little doubt of their being more costly in fuel than those of our own manufacture, though this is not the sole consideration by which their performance and service should be judged. Complaints and criticisms received about them are usually directed more towards the workmanship than the design. The alleged interchangeability of parts is found to be more a question of theory than of practice, and many complaints have been received on the score of defective workmanship."

"Just as some American machine tools have recently been discovered to be hardly up to their vaunted standard, so we now learn that a quantity of steel ship plates imported from the United States had to be rejected, and it seems as if our Transatlantic cousins are beginning to grow careless through their over-confidence in themselves. The importing of American ship plates has been going on for some time, and the consignees were apparently satisfied with the foreign article. Recently, however, a rather large consignment of plates sent to Messrs. Workman, Clarke & Co.'s shipyard at Belfast was rejected on account of many of them being unable to bear Lloyd's tests. These plates were supplied by the . . . and the incident will probably somewhat shake the confidence of British consumers in foreign goods. The company, being hard pressed for time, sent off the plates before Lloyd's official had arrived to make the test, but retained portions of the plates as test pieces. When the official arrived he at first refused to take it for granted that the pieces were actually taken from the plates sent off, and refused to make the test. Later, however, after some inquiry he consented, and it was then found that several of the test pieces failed to meet the requirements. This, of course, led to the condemnation of the whole lot."

A Rail With a Big Flange.

The question of a change of rail section to make a broader and deeper flange is now somewhat urgent. It was brought up at the recent convention of the American Railway Engineering and Maintenance of Way Association, and has been brought before the American Society of Civil Engineers. We show herewith a section of a rail rolled for the Grand Trunk. For the past year 1,500 tons of these have been used on soft cedar ties with good results. The rail is of the American Society section but for the flange, which is made 1 in. wider and ⅛ in. thicker. This makes the height of the rail 5⅛ in. instead of 5 in. and the base 6 in. The broken line in the



A Grand Trunk Rail With Increased Flange.

flange shows the usual American Society section. Mr. McGuigan, General Superintendent of the Grand Trunk, is our authority for saying that these rails have been very satisfactory, so far as maintenance is concerned, and we should suppose that the section would have been acceptable to the mills, although they would probably prefer to make the flange deeper but no wider.

The New East River Bridge.

The last large contract for the building of the New East River bridge will shortly be let. The Bridge Commissioners have advertised for proposals to be received on the afternoon of April 25 for building the suspended structure. We give below a few notes from the specifications, and sketches of certain details will be printed next week. Of course the drawings may be seen in full, as well as specifications and other material, at the office of the Chief Engineer, No. 84 Broadway, Brooklyn.

The suspended structure is 1,600 ft. from center to center of towers, and the contract is to be completed within eight months after the contractor receives notice from the Engineer to begin work. The penalty for delay is $300 a day.

There are to be two continuous stiffening trusses, which just pass through the tower at either side of the river. These trusses are supported on rocker arms on the main towers and on the main floor beams, and their cantilever ends (which, of course, are very short) support the river ends of the land or connecting spans. As to the method of erecting it is provided that the main floor beams are to be supported from the suspender bolts, and these are to be put in position by the contractor for the cables. These floor beams are to be put in place simultaneously from each end of the main span and from as many intermediate points as may be necessary to secure uniform loading of the cables. When these main floor beams are in, with the intermediate stringers and the bottom cord of the stiffening trusses the material for the rest of the work will be distributed over the entire floor. Then the suspender bolts will have a preliminary adjustment, and the stiffening trusses and the remainder of the work will be erected. Before these are finally connected a further adjustment of the suspender bolts will be made.

This suspended structure is to carry six tracks as follows: Four for trolleys and two for elevated railroads. It will carry also two roadways, each 20 ft. wide; two footwalks each 12 ft. wide, and two cycle paths located immediately over the trolley tracks.

A heavy lattice railing will be built on the outer ends of the main floor beams and around the towers and a lighter lattice railing will be built outside the cycle paths.

The steel is to be acid open hearth made from carefully selected pig iron, but acid open hearth scrap from previous heats of the same work may be used to the extent of 25 per cent. subject to the constant control of the Engineer. No stock may contain more than .10 phosphorus or more than .05 sulphur. The finished steel shall not contain more than

Phosphorus	.05
Sulphur	.04
Manganese	.50
Silicon	.10
Copper	.02

The physical requirements are: Tensile strength, from 54,000 lbs., the minimum for rivet rods, to 68,000 lbs. for shapes, plates and pins; elongation in 8 in. 20 per cent. for plates and pins and 25 per cent. for rivet rods; reduction of area, 44 per cent. for plates and shapes and 60 per cent. for rivet rods. Cold bending tests, quench tests, etc., are also specified. The elastic limit is to be not less than one-half the ultimate strength.

Steel for castings is also to be acid open hearth with the following limits:

Phosphorus	.06
Sulphur	.04
Manganese	.80
Silicon	.35

This shall have an ultimate strength of not less than 60,000 lbs., elongation not less than 20 per cent. in 2 in. and test pieces shall bend 90 deg. around three times their thickness. All steel must be made in works of established reputation, and all finished material must be rolled or forged from sections big enough to reduce 16 times in area in forming the finished shapes. It is required that all superintendents and men employed in the steel mills for this work shall be experienced in this line of work and of sufficiently recent practice to insure the best results. Chemical analysis will be made of every melt and the inspection will be very thorough.

All riveted work which does not exceed three-fourths of an inch in thickness shall be punched one-eighth of an inch scant and then reamed. Plates thicker than three-fourths of an inch are to be assembled and drilled. All sheared edges must be planed to a depth of not less than one-eighth of an inch. Wherever practicable the rivets must be machine driven both in the shop and in the field.

Rolling Stock at the Paris Exposition.

March 1, we published a portion of the discussion of Prof. Storm Bull's paper on the Paris Exposition, which was presented before the Western Railway Club in February. Now, we give below some extracts from that paper that relate to the rolling stock exhibition.

Those who have traveled in Europe have no doubt at once been struck by the diminutive types of cars and locomotives as ordinarily found on European railroads. And the same impression one could not help getting—at least to a certain degree—by the inspection of the transportation exhibits at Vincennes. All the great nations of Europe were represented there, and the influence of American practice was plainly visible. Coaches were arranged in such a manner that one could pass from one compartment of a car to the next without stepping outside, and quite a few of the trains were vestibuled. Then, again, toilet rooms were also found in almost every car. The genuine American coach is not used in Europe, except in Switzerland and Norway, I believe, as in all other countries the cars are divided into small compartments. Such was also the case with the coaches exhibited at Paris, the best ones being arranged very much like our compartment sleeping cars, and it is a question whether the traveling public would not be better served if a portion of our ordinary cars were divided up into compartments. In the way of trucks we Americans certainly have the right to look with compassion on our European brothers; their two-wheeled trucks certainly look very primitive and clumsy. But I have really made the experiment traveling in new cars in France—and on a very fast train provided exclusively with these trucks—and find there is but very little, if any more, shaking than on our best American trains. However, there were also exhibited some cars from several countries which were provided with American trucks and wheels.

As to the freight cars, the European equipment looks still more ridiculous than the passenger cars. They are so diminutive that they seem more fit for Lilliputians than for ordinary men. I cannot understand why Europeans still stick to these cars; it seems to me that there cannot be any doubt that these cars must cost more in the first place—per ton capacity—and that, secondly, the cost of hauling must also be greater. There is, of course, one reason why they do not like to change, as a mixed equipment of European and American freight cars might be troublesome, and besides our large American cars could not travel on the European roads on account of their width and height, and presumably also on account of their long open base. It is a fact that the large freight cars exhibited by the Pressed Steel Car Co. could not be brought from Le Havre, where they were unloaded from the ship, by rail to Paris. They had to be put on the canal boats which carry freight from Le Havre to Paris and beyond on the Seine and the canals connecting with this river. These cars, of which there were several, were really a revelation to the Europeans. Compared with the European freight cars, they looked like immense monsters, but also made the impression of being well designed, strong and practical to the last degree. They won the admiration of everybody, and I would not be surprised if these cars would find imitators in Europe.

The locomotive exhibit at Vincennes was very interesting. Our exhibit was very meager. The Baldwin engines did not have anything new in particular, but the contrast with all European engines was necessarily very striking. However, it might just as well be admitted at once that they did not create a particularly good impression on the general public. To the ordinary man the advantages which I think we have the right to claim for our engines, as compared with those built in Europe, are not apparent—as he is too ignorant to understand them. One of the striking features of the engines built by the Continental firms was that, if I remember correctly, not one of these engines was provided with the Stephenson link motion; nearly all had the Walschaert motion. As all the levers and links are put outside the frame, in fact outside the cylinders which on Continental engines always are placed outside the frame, the engine built on the Continent looks very much different from our engines.

Most of you probably remember the European engines exhibited here in Chicago in 1893, how odd they looked. In Paris there were a large number of these engines, and it must be admitted that they really looked very well. The finish, especially on several exhibited by Swiss firms, was so very much better than on the American engines that it could not help but attract attention, and it is a question, in view of our growing export trade in this line, if it would not pay the American manufacturers to finish their engines made for export a little better. It is really surprising to see that, for instance, Russia exhibited some very large and well-designed engines, and this fact also contributed to the impression made on me by the whole exhibition, that Russia is making very rapid strides in advance in almost all directions.

An impression which I gather both from the exhibition and my travels in Europe last summer is that the compound engine is more used over there than here. This is especially true of Germany, France and Switzerland. At the exhibition there were more compound than single expansion engines, and there were a large variety of types. It seems that they have fully made up their mind, in Continental Europe at any rate, that the compound engine is the engine of the future.

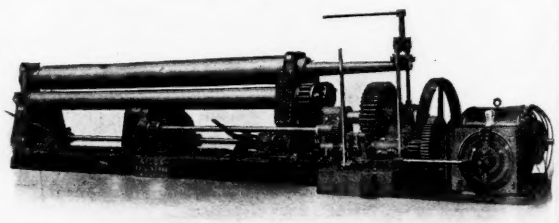
One engine exhibited by Borseg, of Berlin, was provided with a Schmidt superheater. It is the third engine provided with superheater which has been furnished to the Prussian State Railways. From what I could gather it seems that the experience had with these engines has been very favorable, the saving in fuel being at least 20 per cent.

Electrically Driven Bending Rolls.

The engraving shows a set of plate-bending rolls driven by an 18-h.p. reversible, constant-speed motor, made by the Bullock Electric Mfg. Co. The rolls are wrought-iron and have a capacity for bending plates up to 12 in. wide and ⅝ in. thick. The lower rolls are geared together while the upper or bending roll is free. It is adjusted by power. It has a hinged bearing at one end which may be turned down out of the way, while the other end has a long shank extending to a third support which retains the roll in position for the removal of rings or flues. This is an advantage where plates are to be bent to a complete circle.

Midway between the housings a set of supporting rollers is placed to give additional stiffness to the lower rolls. For very long machines additional sets of rollers are added. The machine is firmly tied together by a heavy cast-iron soleplate. It is strongly geared and all parts are substantial. Suitable levers and clutches are conveniently placed for the quick and easy control of all operations. An automatic rheostat is used to prevent throwing on the full current too quickly and burning out the motor.

The field consists of a circular yoke of special steel, and particular attention has been given to a reduction in weight, without sacrificing efficiency. The pole pieces, built up from soft sheet steel of the highest magnetic quality, are securely bolted to the yoke. The shape of the punchings is such as to produce a saturated pole face, and this feature, coupled with carefully proportioned windings, is largely responsible for the sparkless operation of the motor. The field coils are machine-wound and carefully insulated. The shunt and series coils of compound-wound machines are separately wound. The coils are slipped over the pole before it is bolted to the



yoke, and are readily removed. The armature core is built up from thin, carefully annealed sheet steel, possessing a high magnetic permeability. These discs are again annealed and then japanned. They are mounted upon the shaft and held firmly together by malleable iron end plates.

The windings, which are let into slots provided in the periphery of the armature core, are made of either copper bars or wire as best suits the requirements. The coils are machine formed, and are thoroughly insulated. They are baked in steam-heated forms while under pressure, which removes all moisture and produces a perfect and very compact coil. Such a coil is less liable to be injured than when produced by the ordinary method, and requires no further insulation when placed in position on the core. The coils of armatures are held in position by wedges of hard thoroughly dried wood, driven into notches provided near the top of the slots.

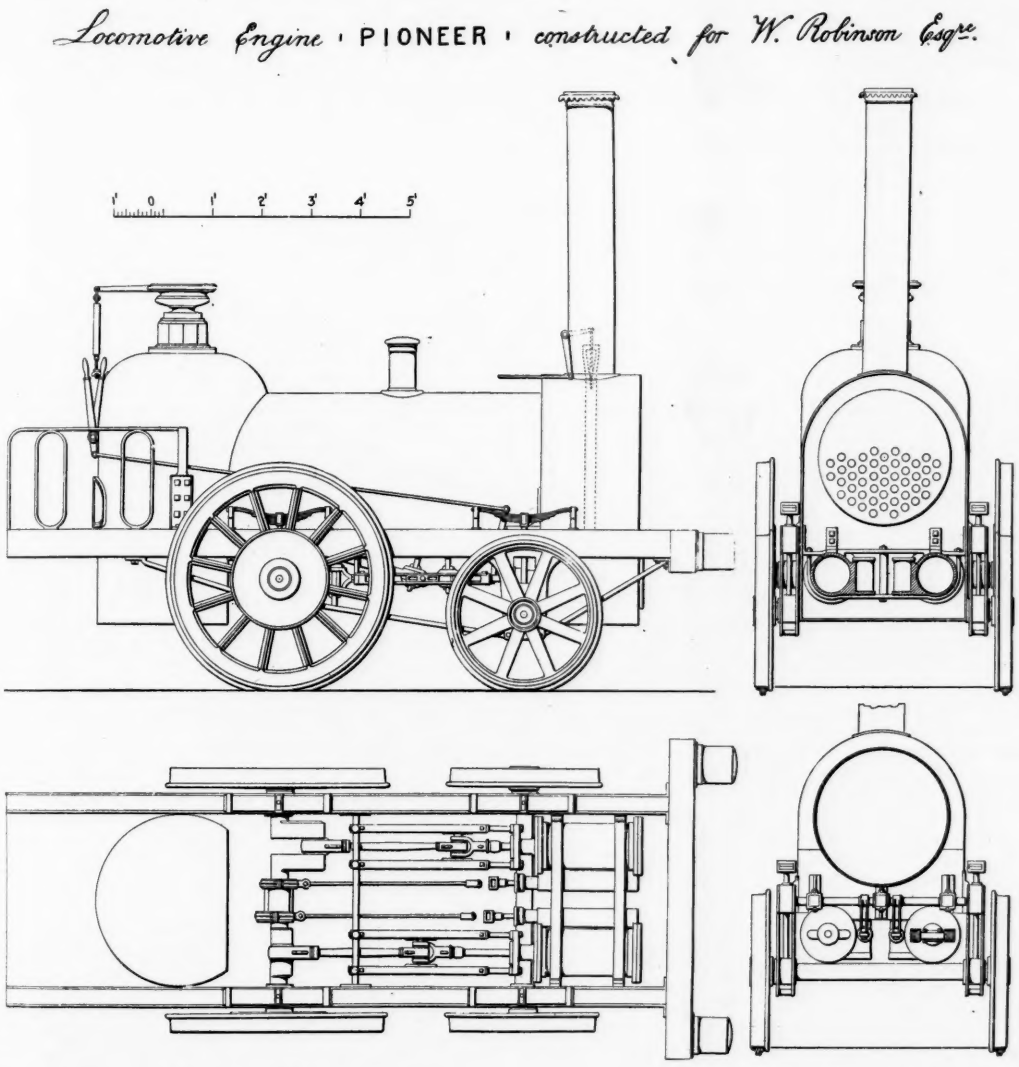
The commutators are built from drop forged bars of pure Lake copper with selected mica insulation. They have great durability and an even wearing surface for the brushes. The brush holder is simple and highly efficient. It is of the reaction type; no adjustment of the brushes is necessary, and when they are once set the motor will operate in either direction without sparking and under all variations of load.

An Engine Built in 1832.

BY HERBERT T. WALKER.

In the early days of American railroads, when the locomotive was but little beyond the experimental stage, many of our engines were imported from England, and between the years 1828 and 1838, about 100 locomotives were purchased from British builders. The engines were shipped over in a more or less dismantled condition, the smaller parts being packed in boxes, and the builders, as a rule, furnished drawings to enable the American mechanics to assemble the parts and rebuild the engines without much trouble or loss of time. As far as the writer is aware, none of these drawings has ever been published, and doubtless few have survived; but one of them, a drawing of the engine "Pioneer," has been for some years in the possession of Major E. T. D. Myers, President of the Richmond, Fredericksburg & Potomac and General Superintendent of the Atlantic Coast Line Railroad, and by his courtesy a reproduction is presented in the accompanying illustration.

The engine was built by Rothwell, Hick & Rothwell for W. Robinson, Esq., no railroad being specified. As


Locomotive Engine · PIONEER · constructed for W. Robinson Esqre.
Union Foundry, Bolton, Lancashire, Nov.r 1832
Rothwell Hick & Rothwell, Engineers.

A Locomotive of 1832—From the Original Drawing.

very few railroads have preserved their original engine lists, an attempt to locate the "Pioneer" has involved much research, and after all available records have been examined, it appears, much to the writer's regret, that no certain information as to the railroad to which this engine belonged can now be obtained. It is known that Mr. Wirt Robinson was an American civil engineer, who was at one time connected with the Reading Railroad, and that he visited England with the object of purchasing railroad material; but as the Reading Railroad was not opened until 1837-38 it is hardly possible that rolling stock would be purchased or even ordered so far in advance. Moreover, the earliest Reading railroad engine list now available discloses that all their English built engines were from Braithwaite, Milner & Co., of London. It may be mentioned in passing that many railroad companies ordered their engines from England through their engineers, purchasing agents, or financial "backers," who dealt with the builders direct, which accounts for the fact that the old order books of English engine builders—for instance, Robert Stephenson & Co., show many engines as having been built for private individuals or firms instead of the railroads the engines were intended for, merely stating that the engines were "built for America." Thus, Stephenson's books indicate that several engines for America were built to the order of Baring Bros. & Co., of Liverpool, the same firm ordering a few of the Braithwaite engines for the Reading Railroad Company, and this fact has led some would-be locomotive historians (including the writer) into confusion and serious errors.

It appears that the firm of Rothwell, Hick & Rothwell ceased to exist many years ago, but a list of their engines built for America will be found in Whishaw's "Railways of Great Britain," London, 1842. This list gives the "Pioneer," construction No. 4, year 1832, but does not state the road for which it was built. The dimensions were: Cylinders, 9 in. diameter by 18 in.; stroke, driving wheels, 4 ft. 6 in.; diamater, leading wheels, 3 ft. diameter; boiler, 6 ft. 4 in. long by 2 ft. 8 in. diameter, containing 50 tubes 1¾ in. in diameter. Heating surface, 149.65 sq. ft.; chimney, 10 in. diameter; blast pipe, 4.42 in. diameter. These dimensions agree with the drawing before us.

The only known official record on the subject in this country is a "Report made to the House of Representatives by the Secretary of the Treasury of the United States in 1838, showing locomotives used on American railroads in 1838 which were imported from England."* According to this report, an English engine named "Pioneer" was running on the road of the Bangor & Piscataquis Canal and Railroad Co., but as the builders were Stephenson & Co., it is evidently not the engine in question.

A search through the *American Railroad Journal*, years 1832 and 1833, has brought to light that the Petersburg Railroad was opened for traffic at the end of the year 1832, and early in the following year the company had "three beautiful locomotives, lately imported." Their names were "Liverpool," "Roanoke" and "Pioneer." The builder of the first two engines was Edward Bury, of Liverpool, but, by a strange fatality, the name of the builder of "Pioneer" is not given. Notwithstanding this unfortunate omission, it is highly probable that the engine shown on the drawing was the "Pioneer" owned by the Petersburg Railroad Co. The chief engineer of that railroad was a Mr. Moncure Robinson. He may or may not have been connected with the "W. Robinson" whose name appears on the drawing, but in either case this would prove nothing.

It may be noted in passing that the State Secretary's Report above referred to gives but one English built engine ("Liverpool") in use on the Petersburg Railroad in 1838, but by that time the "Roanoke" had been sold to the Richmond, Fredericksburg & Potomac Railroad, and the "Pioneer" may, in like manner, have been transferred to some other railroad and its name changed. The fact that some of these English engines were soon found to be unsuitable or too small for the railroads they were built for, and were afterwards sold, *under changed names*, to other roads has been another source of trouble to historians who have thereby credited English builders with more engines than they actually sent over.

A description of these three early engines on the Petersburg Railroad, drawn from contemporary journals, may be of some interest. The "Liverpool" is described as "one of the most effective engines in this country," and all three engines were considered models of speed and power. The "Roanoke" hauled the first passenger train from Petersburg to Belfield, 40 miles, on Christmas day, 1832, when a party of citizens accompanied by several members of the Legislature enjoyed the high pleasure of taking breakfast at Petersburg, dining and spending a part of the day at Belfield, and returning to town before dark, thus traversing the distance of 80 miles "without the least fatigue." The speed was about 20 miles an hour, including several stops.

The "Pioneer," according to the Petersburg *Intelligencer*, was a fast and powerful engine, "giving perfect satisfaction." In April, 1833, a party of gentlemen left town at half past 9 o'clock in the coaches drawn by this engine, for the purpose of attending Greensville Court, remained at the court house about 2½ hours, and returned to town by about 6 o'clock in the evening, the whole distance being 82 miles. "When the necessary delays at the several depots are taken into consideration, the trip will, we think, justify the assertion that they cannot 'order these things better in France.'"

Turning now to the drawing, it will be noticed that it is incomplete, many details being omitted. The most interesting feature is the hollow plug variable exhaust, being, perhaps, the earliest example of this familiar device. Its actuating rod is shown broken off, but it doubtless extended back to within reach of the engineman. A patent for an almost identical arrangement was granted to Ross Winans, Nov. 26, 1840. The leading wheels of "Pioneer" were of cast iron with wrought iron tires. The driving wheels were similar to those on Stephenson's "Rocket" of 1829; they had cast iron hubs, wooden spokes and felloes, and wrought iron tires. The frames were of the Stephenson sandwich type, but were inside the wheels instead of outside, as was common in contemporary practice. The valve gear was of the single-eccentric design. Judging from the drawing the eccentric sheaves were loose on the crank axle, but the mechanism for disengaging them from the slide valves when it was desired to reverse the engine is not shown, although the levers for working the valves by hand during the operation of reversing are clearly indicated.

For the rest, the engine presents no features of special interest, and as a whole, the design was inferior to even earlier engines by Stephenson & Bury. The ornamental cap on the chimney was probably of brass, as was also the lock-up, safety valve cover and the classical-looking vase on the fire-box, which was of the Bury pattern.

*See *American Engineer and Railroad Journal*, March, 1894, p. 133.

Meeting of the Engineering and Maintenance of Way Association.

(CONCLUDED FROM PAGE 238.)

Uniform Rules, Organization, Etc.

D. D. Carothers, Engineer M. of Way, B. & O. S. W., Chairman—At this time your Committee is only able to report progress.

The first thing that confronts us is a definition for a Maintenance of Way Department. We have had several suggested, which are herewith submitted:

The Maintenance of Way Department is a subdivision of the Operating Department, in charge of the maintenance of right of way, tracks and structures.

The Maintenance of Way Department is a subdivision of the Engineering or Operating Department, in charge of maintenance of way, tracks and structures.

The Maintenance of Way Department is a subdivision of the Operating Department, in cnarge of the care of right of way and maintenance of tracks and structures.

In considering the work before the Committee, we have thought it proper to consider, first, a proper organization of the Maintenance of Way Department, then ultimately to enter upon the discussion of the other subjects assigned the Committee.

There are two types of organization—one in which the Division Superintendent is in charge of the Maintenance of Way, as well as other operating departments on his division; and the other, in which the Division Engineer or some officer equivalent reports direct to the Chief Engineer or head of the department.

Information received from 42 of the principal railroads, representing a total mileage of 95,863 miles, regarding the type of their organization, reveals the following facts:

Twenty-three of these railroads, with a mileage of 55,634 miles, have an organization in which the Superintendent has full charge of the Maintenance of Way on his division.

Nineteen of these railroads, with a mileage of 40,229 miles, have an organization in which the Chief Engineer, or officer bearing other title but performing similar duties, is in full charge of all engineering and maintenance of way matters—the Engineers of Maintenance of Way and Division Engineers reporting direct to the Chief Engineer.

It will thus be seen that the organization in which the Superintendent is in full charge of all division matters predominates.

Several diagrams of proper organizations of the Maintenance of Way Department have been submitted and considered by the Committee, but no definite action has been taken.

D. D. Carothers, Baltimore & Ohio Southwestern—The main difference in the organizations that exist in this country is as to whether the Division Superintendent should be in full charge of the division or whether it should be done by a Division Engineer, or some officer reporting to the head of the department. There is at this time an apparent disposition to eliminate the General Superintendent from maintenance of way matters, leaving him entirely to transportation and machinery.

President Wallace—The object of all organizations is to obtain results, and in railroad organizations the ultimate object is the transportation of freight and passengers in a safe, expeditious and economical manner in order that the greatest net returns may be received. That is one thing we ought to bear in mind in everything concerning organization. Another is that while you can conduct, theoretically, a public government on the lines of democracy or republicanism, you can only conduct business on the line of absolute despotism. That despotism must be intelligent, but the man who is wholly responsible for those results must have authority. He must have power in order that he may obtain those results. In the organization on our older roads, years ago, that man was the superintendent. The president was the general promoter or financial man, but the superintendent was the autocrat who ran the railroad. And to-day to obtain the most efficient organization it is necessary that the greatest amount of power possible shall be placed in the hands of the division superintendent, who should be directly responsible for everything concerning the operation of the road, transportation and maintenance on his division. He should be capable and should be broad enough to hold a position of that kind. When you come to his organization, of course he should be assisted by a master mechanic, who looks after and provides his machinery. He should be assisted by a roadmaster, or an engineer of maintenance of way, or whatever you may call him, who should provide the track. He should, of course, in his transportation department, be assisted by his trainmaster and his despatcher, who should operate his trains. But the division superintendent himself should be the general manager of that division. We must have a unity of purpose. We must have one man in absolute control of every operation. You must have it so that the train despatcher is not going to lay out ballast trains because he does not care a cuss for the roadmaster, or because the division superintendent winks at it because he is not responsible. He is responsible for his passenger and freight trains, and if he has not the control of the road department he is not responsible, except indirectly, for the work trains, and he feels that the responsibility is divided.

Now, it seems to me that upon that proposition your larger organization must be built. Of course, a little further on it is necessary to have a general superintendent. Further along it is necessary to have a general manager and with the general manager the chief engineer, who holds the same relation to the general manager that the roadmaster does to the division superintendent.

The object of the general management, of course, is to control a greater or less number of division organizations. But there must be unity of purpose and uniform methods used over the entire road, so that the road may be operated, not for the benefit of any particular division but for the benefit of the road as a whole. When you get to the larger organization you find that it is economy to pay high salaries in order to secure the right results. You, therefore, employ a bridge engineer. You have a chief engineer and you employ a signal engineer, and you employ a superintendent of water supply. What are these men for? These men are intendd to concentrate that class of experience and knowledge in the hands of what you might call a staff that you can't afford to have on the division alone, but intended to supplement the division organization. The application of that knowledge to the division organization and the control of the division organization by the staff should be such that while it will accomplish the best results in uniform methods, the adherence of standards and get the benefit of the larger knowledge that you have to pay more expensive men for, it should not disturb the responsibility of the division organization.

This division organization should be absolute and a unity in itself. The general organization should be a staff organization, and should exercise general control. Of course we have on some roads an organization in which the president (the road being compact or being through the same character of country) can be the executive officer and occupy the same position relatively as the division superintendent holds to the division. This particularly applies where several railroads are combined under one ownership, and in which the presidents are practically division superintendents. On these lines where the conditions are uniform we may have the chief engineer reporting directly to the president, and may have the general superintendent reporting directly to the president, but there we simply have the division organization repeated on a little larger scale.

Mr. McFarlin, Chief Engineer D., L. & W.—I don't agree with your suggestion that the division superintendent should have charge of the engineering. I see no more reason why he should do that than why he should collect the freight to be hauled. It seems to me that the division superintendents have got all they can do to handle their trains, look after the train service, give a good track and make the time-card for it.

The President—Gentlemen, this matter is open. We have struck something now that we don't agree on, and I think that ought to lead to some discussion. Mr. Prout, what are your ideas?

Mr. H. G. Prout, Editor of the *Railroad Gazette*—You have expressed my ideas so completely and admirably that there is nothing left for me to say. It seems to me you have described the organization of the Pennsylvania system. You have there the division superintendent, in charge of the engineering work on his division; and the vital principle of the whole thing is the concentration of responsibility. When a subordinate officer reports to two superior officers, sooner or later there would be conflict of jurisdiction and a loss of responsibility. That is the great lesson taught by modern military organization. As military operations have extended over greater areas and greater masses of troops are involved it is more and more necessary to levolve complete responsibility upon the commanders of the smaller units. Give them a job to do and then hold them responsible for doing it. So far as that goes the suggestion of the President could not be improved upon.

There is another point; if there is any reason why the division superintendent should not take care of the engineering part of the work of his division you can easily arrange for making division superintendents from engineers, which is probably what is coming.

Mr. A. W. Sullivan, Illinois Central—I quite agree in principle with what has been said as to the necessity of there being in the organization of a railroad a point at which all authority is concentrated and from which emanates the force that controls the work that is done. In an experience of many years in different forms of organization it is my judgment that making the division superintendent the central power of authority for all the work in his jurisdiction gives the best results. The expansion of railroad organization, the increasing burden which accompanies it, and the increase of business on the lines, make it more necessary now than ever before to have a general staff. That is the part of the organization which is given to planning the methods and ways and means by which the results of operation shall be developed, and also for fixing standards for maintenance, as well as standards for efficiency in operation. Investing the superintendent of division with authority in all departments puts in his hands the opportunity for so uniting and so arranging the relation of the work of that department that there can be no question as to results, or who is responsible.

Mr. W. L. Breckenridge, Chief Engineer Chicago, Burlington & Quincy—May I ask what organization is in effect on the Illinois Central?

President Wallace—The division superintendents have charge of everything on their divisions, and they report to the chief engineer on all matters relating to maintenance, as far as the lines north of the Ohio River are concerned. South of the Ohio River, on account of the greater divisions there, the road is under the control of an assistant general superintendent, who reports to the chief engineer on all matters relating to maintenance of way, and the assistant general manager on all matters relating to transportation. North of the Ohio the division superintendents report to the chief engineer on maintenance of way ma ters, and the superintendent of machinery on machinery matters, and the assistant general manager on transportation matters. The superintendent of machinery and the chief engineer in turn report to the assistant general manager on matters relating to their departments.

Track.—The Committee on Track (Mr. H. F. Baldwin, Chief Engineer Chicago & Alton, Chairman) presented a report of 40 pages consisting of series of monographs by individual members of the Committee. A few facts gleaned from the report follow:

Out of 19 roads replying to the circulars 10 set center stakes with the transit for lining up track. Sixteen out of the 19 put curves in proper line by setting stakes with the transit. Fourteen use some form of easement curve and all appear to use vertical curves to connect grades. Of 23 roads replying, apparently to another circular, 14 use some form of spiral curve and the Committee discusses at considerable length the mathematics of the Holbrook spiral and gives tables of its elements. There is a discussion of nearly 20 pages of the question of elevation of the outer rail.

Seven pages are given to a monograph on the maintenance of gage. This describes track gages and tools and the method of spiking. Of 25 roads replying to a circular 44 per cent. use tie plates, 32 per cent. use tie plates and rail braces and 12 per cent. use rail braces only to prevent canting of rail. Of the remaining 12 per cent. some roads double-spike the outside of the rail, one adzes the rail seat to cant the rail toward the middle of the track and one has never observed the canting of rails. In a discussion of this item the writer says that rail braces must fail absolutely to prevent rolling out, and that a tie plate is the only known device adequate to provide against this action. He recommends that tie plates be used on every tie of curves of 3 deg. and upward and on soft wood ties all curves should have tie plates. The same writer discusses the practice of various roads in widening gage on curves. Other subdivisions deal with guard rails, tools, etc.

Mr. H. F. Baldwin, Chicago & Alton—We have as our report several articles written by different members of the Committe on Tracks, and which we submit to the Association, with the request that they criticise them and we hope that next year we may be able to submit a report of the Committee.

Mr. C. S. Churchill, Norfolk & Western—In regard to this matter of elevation I think the simplest method is to arrange the track in conformity with the speeds. At a station where the train stops, you certainly do not want much elevation and you do not want much elevation on a sidetrack.

Mr. W. McNab, Grand Trunk—Has any notice been taken of the fact that in double tracks the elevation should be on each track; that each track should be considered as an individual line on curves or grades where the speed is substantially different?

Mr. Baldwin—Quite a number of the replies do call attention to that very fact, for having a double track line on a slope or grade, the elevation of the downgrade is greater than on the upgrade, and I think that is the very general practice from the answer we got.

Mr. P. A. Peterson, Canadian Pacific—I have paid close attention to the question of joints. It seems to me that the question of joints is one of the most important matters we have in connection with tracks. I have been endeavoring to get the American Society to appoint a committee on joints, but so far, as Col. Prout said last night, we have not succeeded. But I hope this Association will take that matter up in a very thorough manner. I would like to hear from the Committee as to wether they have given this matter consideration, or whether they thought it a matter not worth considering.

Mr. Baldwin—We have thought of a good many things, but could not cover them all. We do thoroughly appreciate the importance of the subject of joints, and hope to make a report that will bring out all the good points of joints and all the bad points of the ones we are ordinarily using.

Mr. A. W. Sullivan, Illinois Central—This report is not a report of the Committee. It contains none of the elements of a committee report. The function of the committee is to investigate collectively the subjects assigned to them and present to the Association such phases of the subject as in its judgment is profitable, and to lay before the Association all the information that it can gather on the particular part of the subject with a recommendation for action. The Committee has gone to a great deal of trouble and labor itself and has inflicted much trouble and labor on the members of the Association in answering these questions. The replies have come in very generously, and the responses have been very satisfactory, far above the average. Now that will do for once. It will not be so exuberant next time. If the practice is continued of individual members sending out for information it will be but a very short time until they get no replies at all. The function of an individual should be as a part of the committee. At least he should be confined to the committee, and when a report comes before the Association it should be expressive of the collective judgement of the committee to see if that judgment meets with the broader wisdom of the association. That is the principle and practice that should be followed.

Signaling and Interlocking.—(H. D. Miles, Signal Engineer Michigan Central, Chairman.)—Your Committee has not completed the work on any of the subjects assigned. . . . As stated in the preliminary report made at the last annual meeting the subjects which the Committee would consider first would be those relating to interlocking plants. The joint use and ownership of so many plants by two or more railroads makes the general adoption of like rules, specifications and standards relating to such plants a matter of considerable importance. . . . Considerable work has been done on plans and specifications. Blue prints of the plans completed are submitted. As numerous references to the plans will be made in the specifications, the latter will not be ready for submission until all of the plans are completed. . . .

The adoption of standard designs of signal, switch and lead-out material by most of the railroads will materially reduce the number of parts to be carried in stock at joint interlocking plants and will reduce the expense of construction and maintenance of such plants. . . . Mounted and detail plans have been made of high and dwarf signals and lead-out cranks, rocker shafts, chain wheels and foundations. . . .

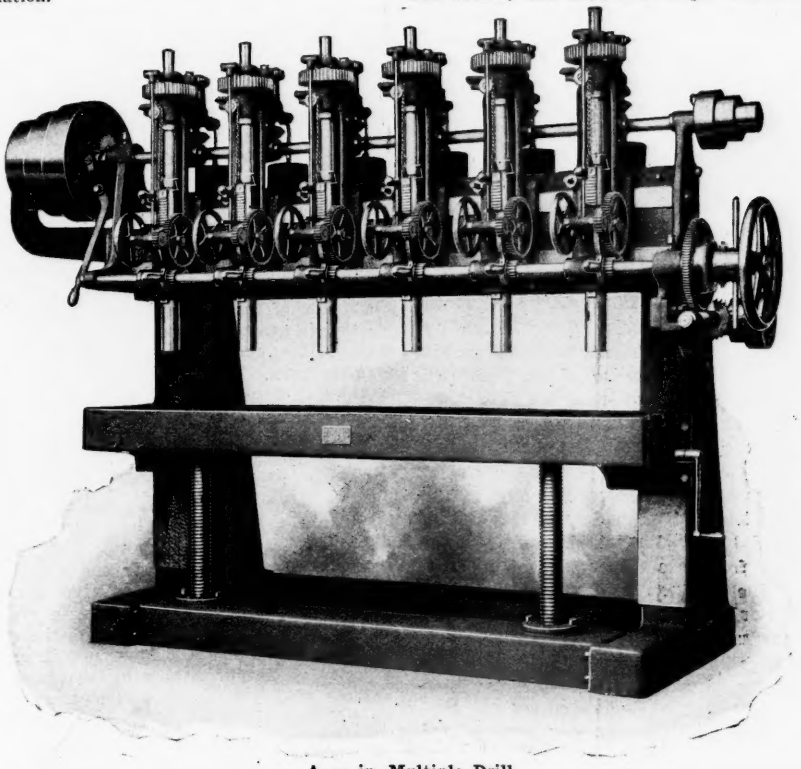
The Committee has not yet come to a decision on the form of signal arm to recommend, although at least three designs are under consideration. It was the intention at first to recommend two different forms of signal-arm castings for interlocking purposes, one of which designs is shown on the drawings of mounted signals. The latter arm is designed for a 70 deg. arc of travel and to give two indications by position; the other arm was to be designed for a 90 deg. arc of travel and to give three indications by position. . . .

After considerable thought and investigation the Committee decided to look further into the matter and to secure the opinions of members of the Association before making any recommendation. . . .

The rules on operation of interlocking plants have not been considered by the Committee, because, as stated in the report made at the last season's meeting, it is a subject which should be considered by operating officials, and as there was no objection made to that, the Committee has acted according to its original intention.

The standard apparatus in connection with the interlocking plant is easier to determine; but the signal which is to be observed by trainmen and which should be standard, if possible, over all the country, should be of the same design and have the same position for the indication to be given. In taking up the question with railroad men and signal engineers it finally was able to secure a drawing from the Union Switch & Signal Co. which could be used uniformally for all purposes. The horizontal position of the arm would indicate danger in all cases, unless the Association considered that the horizontal position should be also used for the caution indication at interlocking plants and depend on the fish-tail blade and the color of the blade to distinguish the distant signal from the home. If that practice is carried on the inconsistency will be recognized as most train-order signals have three positions. Where three indications are desired to be given by one blade they must be given by three positions of the blade, and that blade must also have the same form, and while the Committee has not fully decided what it will do in that regard it will be very glad for an expression of the opinion. It will say in connection with this that it is rather favorable to the adoption of a three-position arm for the three indications to be given, namely, danger, caution, and clear. Also to have them clearly established for all purposes.

Mr. A. W. Sullivan, Illinois Central—I want to know if this Committee recognizes the work that has been done by the American Railway Association for the operation of signals. Its recommendations have been adopted and are now the standard practice on all the lines members of the Association.



A 12-in. Multiple Drill.

Mr. Miles—The report states that the Committee will give full consideration to all rules and recommendations adopted by railroad associations on signals. The American Railway Association has adopted certain rules on operation which, as I stated before, it was not the intention of this Committee to consider, or to make any report on in any way. But in regard to the rules for maintenance the Committee would consider those recommended by the American Railway Association. It is the opinion of the Committee that those rules on maintenance are not quite complete, and also on specifications. While covering it in a general way they do not cover it enough in detail for the engineers and signal engineers, and it was therefore the opinion of the Committee that we would go more into detail than the American Railway Association. I believe no association has done anything, however, with standard drawings, standard apparatus, and when you go into details of standard apparatus you must go pretty thoroughly into details of standard specifications.

President Wallace—It would seem to me that the function of the American Railway Association should be to determine everything that relates to the indication. That is, they should determine the form and shape and position of the signals. It should be the function of this Association to then determine standard designs and mechanical construction and maintenance necessary to give those indications required by the American Railway Association who should control the matter from the transportation standpoint.

Mr. H. G. Prout, Editor of the *Railroad Gazette*—I would like to suggest an idea which is not exactly pertinent to the discussion of this report but it is interesting, and that is that the time may come when the American Railway Association will be the head of all these various associations. The American Railway Association would naturally and logically be the center of the work, and coordinate it. I know that when Mr. Loree went in as President of the American Railway Association he thought of this, but I doubt if anything has been done in that direction. It is a good idea to suggest as no doubt many of the gentlemen here will sooner or later be members of the American Railway Association, and it is something for them to think about.

More particularly in regard to this report. It strikes me that possibly the time has hardly come for standardizing many of the details of interlocking and signaling, for the change that is going on in that sort of apparatus is pretty radical and pretty rapid. As, for instance, we may look forward to getting rid of all disc and banjo signals, and to the automatic semaphore, electrically operated. While that is likely to come, of course I have nothing to say against the disc and banjo signals, because I recognize their place and the great utility they have served; but we are in rather a transition period, a period where it would be dangerous to try to do much in the way of standards.

A 12-in. Multiple Drill.

The six-spindle multiple drill shown by the accompanying engraving is one of three machines designed a short time ago for the Chicago, Milwaukee & St. Paul by the Bickford Drill & Tool Co., Cincinnati. The builders have also received an order from the Baltimore & Ohio for two multiple drills of the same type and also one of a larger style. It is a strong, well-designed tool, embodying the best features of modern practice, and is capable of drilling simultaneously six 1½-in. holes in steel. The spindles have six changes of speed, with three changes of feed for each speed, and are provided with both hand and power feed, quick advance and return, and automatic stop. The heads are composed of the least number of parts consistent with durability and convenience of operation, are adjustable on the rail, and may be used independently or collectively as desired, each head being complete in every particular. The back gears are located inside of the cone, and are so arranged that they may be instantly engaged or disengaged, or the spindles may be stopped altogether by one stroke of a lever. This latter is a new feature. The rail and table are made in four lengths, ranging from 5 to 11 ft. The 5, 7 and 9-ft. tables are adjusted by means of two screws only, while the 11-ft. one has three screws, operative in both cases from the front of the machine. The machine can also be fitted with a plain table if desired. The Bickford Co. has built a large variety of multiple drills, some of which have as many as 30 spindles. It makes a specialty of drilling machinery for railroad shops, including suspension drills, overhead traveling drills, car buffer drills, arch bar drills, locomotive frame drills and side rod drills. A new catalogue containing descriptions of these railroad tools has just been issued.

New York Canals.

The bill introduced in the Legislature of New York for the improvement of the Erie, Oswego and Champlain Canals provides that a proposition shall be submitted to the people of the State at the general election in 1901 for the issuing of bonds to an amount not exceeding $26,000,000, bearing 3½ per cent. interest and payable in 17 years. The improvement contemplated will give a depth of 9 ft. of water throughout the Erie and Oswego canals over all structures, and a depth of not less than 7 ft. on the Champlain Canal. Locks on the Erie Canal will be lengthened on one side so as to take two boats each 125 ft. long, 17½ ft. wide, and 8 ft. draught; the adjoining lock accommodating one boat of the same dimensions. The present capacity of the Erie and Oswego canals is sufficient for boats carrying 240 tons each, while the improvement provided by this act will accommodate boats carrying 450 tons. On the 9th the Assembly Canals Committee agreed to report favorably to the Assembly the bill described above.

The Telluride High-tension Electric Lines.

In the *Railroad Gazette*, Aug. 10, 1900, was an account of some of the phenomena observed on the high-tension line of the Telluride Power Transmission Co., in Utah. An article in a recent issue of the *Electrical World and Engineer* gives information of the extension of these lines. The article refers to experiments made with 135,000 volts on the line and says this company has for three years been operating a line at 40,000 volts, transmitting from the Provo Cañon, north of Provo, Utah, to Mercur, Utah, a distance of 35 miles. This was principally for supplying power to mines, and is the highest voltage line in regular commercial use. In addition to this, 70 miles more of high-tension line has been completed, so that the transmission line now completely encircles Utah Lake, supplying power and light to various points on the circuit and returning to the Provo Cañon plant from whence it starts. The circuit is sectioned so that in case of a breakdown on one section that section can be cut out and the service supplied by the lines on both sides of the interruption. Repairs are regularly carried on in this way without interruption of service. No repairs are made on the live line, as it is impossible. The transformers are operated with Y-connection, and the neutral point is grounded for the protection of the transformers against lightning. In the three years since the plant started the only 40,000-volt transformer lost was one which accidentally got wet.

The high-tension line from the Provo Cañon power house to Mercur has 44 poles to the mile, and consists of three No. 5 copper wires. From Mercur to Eureka the line is of aluminum stranded cable, equivalent to No. 5 copper, and made of seven strands, .088 in. diameter. From Eureka to Provo the line is stranded aluminum cable, seven strands of .099 in. diameter. Poles on the aluminum line are set only from 26 to 33 to the mile on account of the lightness of the aluminum. This, of course, makes quite a difference in the cost of the line as compared with copper in addition to the saving in the cost of the wire. Solid aluminum wires were first put up, but had to be replaced with stranded cable, because of breakage.

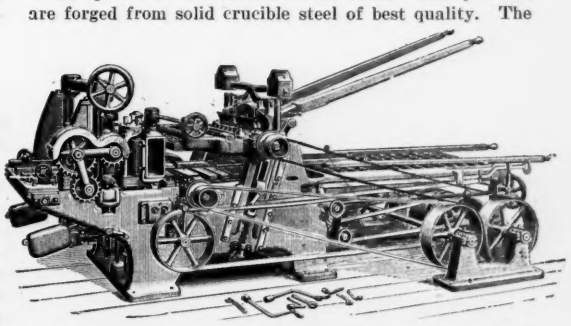
At most of the sub-stations, the reduction is from 40,000 to 5,000 volts, for local distribution. The greater part of the company's load is in the shape of induction motors. There are a few towns lighted, but that load is small compared to the total.

The capacity of the 105 miles of line is very great. With no load on but the transformers, the apparent kilowatts at the power house are 750, and the actual watts nearly nothing. As the load comes on the wattmeter rises and the ammeter falls until at about two-thirds of the station's full load, the power factor is 95 per cent. No need for synchronous motors to improve the power factor on that line. It is, however, a novel sensation to the majority of engineers to see the ammeter fall as the load rises. The 5,000-volt distribution in the town of Provo is over No. 8 B. W. G. iron wires.

Although the Telluride Power Transmission Company's Utah system is already extensive, important permanent additions are to be made to it. In place of the present plant in Provo Cañon, a more permanent one will be built at the mouth of the cañon to develop 8,000 h.p. at 380-ft. head. There is now going in at Logan, Utah, a 3,000-h.p. plant, which will connect in parallel with the present 105-mile circle by a 90-mile 40,000-volt aluminum line running down past Ogden and Salt Lake City, at which latter place it is not unlikely that some power will be delivered. A 15,000-h.p. water power is also being developed 70 miles from Butte, Mont., by parties interested in the Telluride Power Transmission Company.

New Dimension Planer and Jointer.

The illustration is of a new 30-in. double-cylinder endless-bed dimension planer and jointer, made by the J. A. Fay & Egan Co., Cincinnati, Ohio. This machine is especially adapted for heavy surfacing on one or both sides. It works stock on two sides, 30 in. wide and 14 in. thick; will plane all four faces of a timber up to 28 in. wide and 14 in thick; will plane, at one operation, two sides and one edge of two pieces of material up to 12 in. wide and 14 in. thick. The cylinders are forged from solid crucible steel of best quality. The



side-cutting heads are slotted and carry four knives. The feeding mechanism consists of a traveling bed, supported on four steel-faced ways, over which are placed two divided rollers, under which two boards of unequal thickness may be placed and fed at the same time. The feeds usually furnished are 40 to 60 in. a minute.

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EDITORIAL ANNOUNCEMENTS.

CONTRIBUTIONS—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies in their management, particulars as to the business of the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and railroads, and suggestions as to its improvement. Discussion of subjects pertaining to ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

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Internal Friction in Locomotives.

Mr. C. S. Brown, in a recent paper before the Engineering Association of the South, discusses the cost of a horse-power as developed by steam machinery, and incidentally runs into some surprising errors. He refers, for example, to the results of certain French experiments which show the pull at the drawbar of a locomotive to represent but 43 per cent. of the power which is developed in the cylinders of the engine, and asserts that the difference (57 per cent. of the indicated power) "was absorbed in the mechanism of the engine itself." Not content with this statement, he supplements it by the assurance that these results, remarkable as they may have been, were recently confirmed by tests conducted by the Pennsylvania Railroad.

Before passing on to discuss this matter in general we will stop a moment to speak once more of the Pennsylvania tests to which Mr. Brown probably refers. Those tests were made in the fall and winter of 1899 and 1900. As long ago as 1895 we pointed out that for certain reasons, inseparable from the conditions under which the tests were made, they were not accepted as being more than merely suggestive, even by the officers who had caused them to be made. We pointed out also that it was quite true that considerably more than 50 per cent. of the indicated horse-power failed to appear at the drawbar behind the tender, but we pointed out further that the weight of engine and tender was in each case a very large percentage of the total train weight. If the weight forward of the drawbar is a large proportion of the total weight it must necessarily absorb a large part of the total power developed. In those Pennsylvania tests an engine and tender which weighed 84.5 tons hauled a train which weighed 136.5 tons behind the tender. At 61 miles an hour only 48 per cent. of the indicated horse-power appeared on the drawbar; at 65 miles an hour, 49 per cent.; at 51 miles an hour, 42 per cent. It will be seen that a large part of the power developed in the cylinders belongs to the engine by virtue of its relative weight. The engine and tender were 38.2 per cent. of the total train weight. The power which disappeared forward of the drawbar was 52 per cent., 51 per cent. and 58 per cent. The differences are then 14, 13 and 20, respectively, which is something like the amount left to be accounted for by losses peculiar to the engine itself; but we would again caution the reader that there were several uncertainties connected with the making of these tests, and we have never cited the results except when other people have taken them up as proving something, which in the nature of things they cannot do.

We may now proceed to consider briefly the point raised in Mr. Brown's paper. It is a fact that a locomotive running at the head of a train, especially when the speed is high, develops at the drawbar a comparatively small percentage of the power developed in the cylinder. For ordinary conditions of speed, it may be said that the drawbar horse-power will vary from 40 to 70 per cent. of the indicated horse-power, but it is not true, as is stated by Mr. Brown, that the difference, say, from 30 to 60 per cent. of the indicated power of the engine is absorbed by the mechanism of the engine.

In a discussion of the question raised, it is first of all to be noted that a part of the observed difference between the tractive and the indicated horse-power of a locomotive is apparent only. A determination of the power developed in the cylinders, by means of indicators attached to pipes of considerable length, such as are necessary upon the road, leads to inaccurate indicator records, and results based upon them are always in excess of the true values. The extent of errors thus introduced depends upon the speed, the steam distribution within the cylinders, and the length of pipe. Under conditions not uncommon in practice, the error may equal 10 per cent. of the indicated power. Correcting, for inaccuracies arising on this account, the actual loss between the cylinder and drawbar becomes considerably reduced.

Assuming that we know the amount of power which is lost between the cylinders and the tender drawbar for a given case, we may next inquire as to the channels by which it disappears. These are three in number, namely, the resistance offered by the atmosphere to the forward movement of the locomotive, the axle and wheel friction which is offered by the tender and by that portion of the engine which rests upon its trucks, and the machine friction of the engine, in which is included the rolling friction of the drivers. The atmospheric resistance to a locomotive at the head of a train may at high speed equal 200 horse-power, or, say, from 15 to 20 per cent. of the indicated power of the engine. The resistance offered by the tender and engine trucks of a locomotive may be assumed to be the same as for an equal weight of train behind the tender. For a locomotive drawing a light train at high speed it will frequently amount to 15 per cent. or more of the indicated power of the engine. The portion of the loss, therefore, which is unaccounted for, and which only can be charged as machine friction, is comparatively small.

Direct measurements of the power absorbed by the machinery of a locomotive, made upon a testing plant, as reported by the Purdue Exponent,* show the value to vary from 5 to 15 per cent. of the indicated power of the engine. It may be said that in general the friction loss when measured in terms of the indicated power, increases with increase of speed. It varies, also, with the steam distribution, being proportionately greater for short cut-offs than for those cut-offs which are long. A comparison of the frictional losses incident to the working of a locomotive with similar losses in other types of high speed engines is not unfavorable to the locomotive.

Russian Grain Rates.

The existing grain freight traffic on the Russian railroads, which has been in force but a few years, is a strongly differential one; that is, the rates per mile are much higher for short than for long distances. These rates apply, however, only in European Russia. Shipments of grain over the Siberian railroad are charged for as if they went no further than its western terminus, even though consigned to the Baltic, 2,823 versts (1,181 miles) further. The whole grain tariff will be illustrated by the charges over these 2,823 versts, which are made up as follows for a carload of 27,000 lbs.:

First	180 versts at 30	kopeks.....	54.00 rubles
Next	140 versts at 12	kopeks.....	16.80 rubles
Next	480 versts at 11	kopeks.....	52.80 rubles
Next	320 versts at 9	kopeks.....	28.80 rubles
Last	1,703 versts at 6½	kopeks.....	110.70 rubles
Total		.....	263.10 rubles

This is $135.50, or at the rate of 50 cents per 100 lbs., besides some small terminal charges. It is equal to 0.532 cent per ton-mile and is, of course, a very low rate. The division of the freight among the different railroads forming the route is another matter entirely, which need not be considered here.

Complaints having been made concerning this grain tariff, the Russian Minister of Finance summoned to a conference on the subject last September a number of persons representing the grain-growers, millers, commercial exchanges, railroads, and various government departments, to whom was submitted a new grain tariff, a tentative plan only, which has one very peculiar feature. For, while up to a certain point, as in the old tariff, the rate per mile decreases for long distances, beyond that point it not only does not decrease but increases sharply.

Thus, the change per carload per mile by this proposed tariff is:

1 to 180 versts	.....	30 kopeks
181 to 440 versts	.....	11½ kopeks
441 to 800 versts	.....	10 kopeks
801 to 1,340 versts	.....	8⅓ kopeks
1,341 to 1,640 versts	.....	4⅙ kopeks
1,641 to 2,823 versts	.....	6½ kopeks
Over 2,823 versts	.....	9⅜ kopeks

Thus the rate per verst for the 300 versts in excess of 1,340 is but half as great as for the 540 versts between 800 and 1,340; but for 1,183 versts in excess of 1,640, it is one-half more, and for all distances greater than 2,823 it is more than twice as great as for the last 300 versts of 1,640.

This is evidently fitted only to the special circumstances of the Russian railroad system at the present time, and would be entirely irrational as a general rate system. By increasing the rate largely beyond 2,823 versts it becomes possible to apply the proposed tariff to the Siberian Railroad, as this distance cannot be made in Russia without taking in part of it; and the application of the existing grain tariff to cover that road would doubtless result in a loss to the railroads as a whole, and might enable Siberia to compete with Russian grain-growers for the supply of European Russia, which would be very unpopular in Russia, where the grain-growers are still the great mass of the nation.

The application of the proposed tariff would make the charge from the western terminus of the Siberian Railroad to the Baltic 288.30 rubles per carload, against 263.10 by the existing tariff. It is assumed to be intended to force Siberian grain shipments from the long rail route across Russia to the Baltic to the shorter rail-and-river route northwest to Archangel and the White Sea (Arctic). For distances between 180 and 1,340 versts (120 to 890 miles), the rates by the proposed and the existing tariffs are nearly the same; then for the next 300 versts (200 miles) they are lower by the proposed tariff, but the difference for 1,090 miles is only 5 per cent. This belt, then, is the only one favored by the proposed tariff, whose chief novelty is in discouraging shipments from points more than 1,100 miles from the Baltic.

In the conference doubt was expressed whether any reduction of grain export rates is desirable. With its growing manufacturing industries Russia has no occasion to endeavor to throw more and more grain on the European market. Moreover, it was questioned whether the grain growers would get any benefit from reduced freight charges, which would be quite as likely to increase the profits of the traders and the steamship companies. Further it was questioned whether a reduction could be made without making the charges less than the cost of transportation. Materials and labor have risen materially in price since the existing tariff was introduced. When a vote was taken as to the necessity of lower rates in order to hold the European market, a considerable majority voted that there is no such necessity.

On the question whether export rates should be the same as domestic rates there was a wide difference of opinion. Many favored special export rates, but some of these would have the export rate higher and not lower than the domestic rate; and some wished for rates on wheat different from those on other grains. Another question regarded differences between grain and flour rates; these are the same now, with the very important difference that a rebate of 20 per cent. is granted on flour exported. The millers were in favor of retaining this; but the grain growers were divided, and some of them claimed that the great mills, which are the chief flour exporters, are an injury to the farmers, and asked that rates be higher on flour than on wheat.

A representative of a railroad in Southeastern Russia complained that America has a monopoly of the grain and flour supply of the entire Amoor valley, which is due entirely to the lack of enterprise of Russian traders, since freights from Odessa to the Russian Pacific ports are no higher than from San Francisco. A representative of the Russian commissary department said that the army in the Far East is dependent entirely on American and Manchurian grain, although it is much mixed with Indian corn and comparatively dear. He wanted rates made to favor shipments from Western Siberia to the East, so as not only to break the American monopoly but to get better flour.

All representatives of the grain growers joined in signing a memorial which declares that regularity in the traffic of the railroads and especially the avoidance of accumulations of freight at the stations are of by far greater importance than the rates.

Annual Reports.

"Omaha" Line.—The annual report of the Chicago, St. Paul, Minneapolis & Omaha Railway for the year ending Dec. 31 last, besides giving the record of the year's operations, is a reminder that there is nothing very new in the recent consolidation movement, except the extent to which it has gone. The "Omaha," though managed as an independent road, is controlled by the Chicago & Northwestern through the acquisition of a majority of the shares as long ago as 1882. It is only recently, however, that the Northwestern has received much or any direct return on its investment on Omaha shares. Dividends on the $11,260,000 preferred shares outstanding have been paid pretty continuously, but at irregular rates until 1893, since which time the full 7 per cent. has been paid, while common share dividends were not begun until 1897. For two years only 2 per cent. was paid, while the rate for the last two years has been 5 per cent.

On an average of 1,544 miles operated, as against

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1,498 miles in 1899, the company earned gross $10,342,000, a decrease of $146,814. Expenses and taxes were 62¾ per cent. of this, and the net income over charges was $2,398,125. This provided for dividend payments of $1,716,726, and a special appropriation of $500,000 for additions and improvements, a similar amount having likewise been appropriated in 1899. The decrease in gross earning is attributable entirely to loss in freight revenue, the decrease here being $374,300, or 5 per cent. Passenger earnings increased, as did miscellaneous revenue.

The tonnage movement of the year is not commented upon, and no commodity table is published, but it is venturing little to say that the bad spring wheat harvest last summer in Minnesota and South Dakota, where the company operates 473 miles and 88 miles, respectively, or over a third of its total mileage, explains the loss in freight revenues.

One of the interesting facts brought out in the report is that the company was able to increase its freight car and train loadings, despite the loss in tonnage movement. The ton-miles were 756,000,000, a decrease of 34,000,000, or 4½ per cent., as compared with 1899. Car mileage is not reported, but average tons per loaded car increased fractionally, and the average train load obtained was 242 tons, against 236 tons in 1899, and 219 tons in 1898, and the freight train miles decreased 8½ per cent. The higher train load secured is all the more noticeable because the traffic gained in the year, offsetting in part the loss of wheat tonnage, must have been in classes moving in light train loads. Besides a decreased tonnage a fall in the average rates also operated to decrease freight revenues. The ton mile rate last year was 9.71 mills, against 9.77 mills in 1899 and 9.67 mills in 1898. Nevertheless, through the better car and train lading, earnings per train mile last year were $2.35, comparing with $2.31 and $2.12 in the immediately preceding years.

All improvements carried out last year except $38,300 for side tracks and yards and $272,300, balance of cost of elevator and docks at Superior, were paid for out of last year's special appropriation. Betterment work included much changing of grade and line, heavy bridge work, etc., the cost of which was $262,000. In addition new equipment costing $207,855 was charged to this fund besides the equipment purchased through equipment renewal funds. The increase in mileage is accounted for by the completion of the Des Moines Valley Railway, 39 miles, and a branch to Fairmont of 29 miles.

Some American railroad managers would like to get rid of their passenger traffic and devote their energies entirely to freight, because freight is so much more profitable. Others, less radical, would be content, for a time at least, if they could close up about two-thirds of their passenger stations, those which bring in little or no profit. In contrast to these views *Herapath's Railway Journal* (London) gives the results of English experience thus: "Dr. Masson, of Edinburgh, who complained at the Caledonian Railway meeting that coal and mineral traffic did not pay, at any rate proportionately to passenger traffic, was not far out. With improved means of haulage and better rates the case would be different, but at present the colliery proprietor has a bonus at the expense of passengers. Mineral traffic pays on a mineral line with rough-and-ready, cheap equipment, but with the high capitalization involved in modern stations and terminals it is very doubtful if low-grade tonnage of any kind pays."

The Empire State Express of the New York Central is so heavy and runs so fast that the company has never yet indulged in the extravagance of running a dining car on it. But many passengers want a luncheon or a meal in a journey of eight hours and, after a series of experiments, the road has made one of the passenger cars into a semi-dining car. That is to say, a small kitchen is provided and food is served to passengers on temporary tables set up between two seats. We cannot make out from the announcement whether these tables are supplied in all of the cars on the train or only in the one in which the kitchen is situated. As a large share of the passengers on this train travel only from 100 to 150 miles the percentage of the whole who want to eat is, we suppose, moderate. The cooking culinary bureau is called the "Empire kitchen," and meats or game can be broiled for 10 persons at once. A cafe service has always been a feature of these trains.

NEW PUBLICATIONS.

American Industrial Education.—At the New York meeting of the Society for the Promotion of Engineering Education, held last July, a report was presented on "American Industrial Education; What Shall It Be?" Prof. J. B. Johnson was the Chairman of the Committee making the report, which was noticed at considerable length by us at the time of the meeting. This report is now printed, together with an abstract of the discussion, in a pamphlet which can be obtained from Prof. Henry S. Jacoby, Cornell University, Ithaca, N. Y. The price is 25 cents.

Engineering Structures in Nova Scotia.—Mr. Martin Murphy, Provincial Government Engineer, Halifax, N. S., has presented, under date of February, 1901, his report on the subsidized railroads and other public works in the Province of Nova Scotia. This is chiefly interesting because of the "Smaller Bridge Act" and the specifications for various sorts of engineering work embodied in the pamphlet. This act was passed March 30, 1900, and it is designed to secure uniformity as well as a higher character of construction. The specifications cover masonry of various classes, bridge superstructure, grading and all track work, rails, fittings, etc. The pamphlet also contains forms for contract, and altogether it should be useful to those seeking contracts in that province. It can doubtless be had by addressing Mr. Murphy.

The Traveling Engineers' Association.—The eighth annual convention of the Traveling Engineers' Association was held at Cleveland last September. The proceedings of that convention now appear in a volume of 346 pages, with list of members, index, etc. The papers and discussion cover a considerable range of topics. The report can doubtless be had from Mr. W. O. Thompson, Secretary, Elkhart, Ind.

TRADE CATALOGUES.

Pneumatic Tools.—The Chicago Pneumatic Tool Co., 632 Monadnock Block, Chicago, have issued their special edition No. 12 catalogue containing illustrations of practically every application that can be made of pneumatic tools. Among these are examples of drilling, chipping, calking and riveting, among the work of chippers being some interesting illustrations of the work of sculptors. Various operations in shipbuilding are shown. On pages 30 and 31 are illustrations of a mud ring riveter and a tank riveter that are interesting to locomotive builders. On pages 36 and 37 are good views of the Chicago No. 0 reversible drill which runs in oil. The catalogue is well worth inspection.

Materials for Narrow Gage Railroads.—Arthur Koppel, 66 and 68 Broad street, New York city, sends catalogue No. 41, being his first for the year 1901. This shows narrow-gage railroad material for portable and permanent tracks and for industrial railroads. The material includes rails, and all their fixtures (steel ties among other things), trucks and cars of many sorts and their parts, and some miscellaneous material. The pamphlet has photographs showing narrow-gage and industrial railroads in different countries.

Carriers and Foundations for Interlocking Lead-Out.—The Detroit Pipe Carrier Co., of Detroit, Mich., manufacturers of special interlocking appliances, have issued a catalogue showing pipe and wire carriers for connections to switches and signals, showing also iron and concrete foundations for these carriers. They make special types of carriers which have been adopted as standard by several important railroads, and which have a number of convenient modifications from ordinary designs.

The Curtain Supply Co., of Chicago, who bought the curtain and curtain fixtures department of the Adams & Westlake Co., the E. T. Burrowes Co., Forsyth Bros. and the Davis Car Shade Co., has just issued a catalogue covering all kinds of curtains and curtain fixtures. The purchase of the machinery, merchandise and good will of the above concerns, together with all the patents, enables the Curtain Supply Co. to furnish any kind of curtain or curtain fixture without fear of litigation.

Automatic Block Signaling; Normal Danger vs. Normal Clear.—The Hall Signal Company, New York and Chicago, has issued a pamphlet of 14 pages on this subject, replying to the arguments presented in a circular issued a few months ago by the Union Switch & Signal Company. The Hall Company defends the normal danger principle, though it is asserted that, from a commercial standpoint, the company has no preference; it will put in signals to be worked either way.

Melan Bridges.—The Melan Arch Construction Co., New York, has issued a new edition of its last catalogue, with some additional matter illustrating and describing Melan arch bridges at Indianapolis, Ind., and Rhinebeck, N. Y.

Pure Water for Steam Boilers.—The Industrial Water Company, 15 Wall street, New York, has issued the 15th thousand of the pamphlet reprints of articles by Mr. Koyl, published in the *Railroad Gazette* a little less than a year ago. Many of our readers will remember these articles, which are a remarkably good round-up of the problems of the purification of feedwater.

Exterior Decoration.—The H. W. Johns Mfg. Co., 100 William street, New York, has issued a pamphlet designed to show a number of combinations of colors suggesting proper harmony and contrast for exterior use. There are suggestions for shades and trimmings, specifications of the various colors and numerous patented designs for combinations.

The Lufkin Rule Co., Saginaw, Mich., has issued a new 6 x 9-in. catalogue of steel and linen measuring tapes, straight and folding rules for ordinary uses, as well as special rules for measuring boards, lumber and logs. The pamphlet has a large number of engravings.

Grinding and Polishing Machinery.—The Diamond Machine Co., Providence, R. I., has just issued a 140-page catalogue and price list. The pamphlet measures 6 in. x 9 in., is well printed and contains illustrations of the various styles of grinding and polishing machinery, lever and screw feed lathes, special machines, polishers' supplies, etc., made by the company.

Pneumatic Tools.—The Standard Railway Equipment Co., St. Louis, Mo., has issued a Pneumatic Tool Catalogue that illustrates and describes the "Monarch" tools and all their parts; shows some air compressors and air hoists sold by this company, and gives some good illustrations of boring, riveting, chipping and drilling by compressed air on car and locomotive work. A list of details of these tools is given.

The Taylor Gas Producer.—Messrs. R. D. Wood & Co., of Philadelphia, have recently issued a third edition of their pamphlet on this subject. It is a volume of 106 pages and contains much information on making and using producer gas for power plants. Those who are interested in this important subject should procure this pamphlet.

Punching Presses.—Messrs. E. W. Bliss Company, Brooklyn, N. Y., issue a small catalogue of "Stiles" power punching presses. These are illustrated in general and in some detail, with tables of dimensions, capacity and price.

Ventilating Fans.—The B. F. Sturtevant Company, Boston, Mass., have issued a new illustrated catalogue of disk and propellor fans. This shows fans driven by direct-connected engines, electric motors and belts.

Valves, Packings, Etc.—Jenkins Bros., 71 John street, New York, 31 North Canal street, Chicago, etc., issue a 1901 catalogue of valves, packings, gage cocks and other fittings.

The Noark Fuse.—The H. W. Johns Mfg. Co., 100 William street, New York, send a little pamphlet with the above title. It is intended to advertise electrical fuses of various styles and capacities.

The Life of a Cedar Log.

The engraving is from a photograph taken near Acme, in northwestern Washington, by Mr. Romeyn B. Hough, of Lowville, N. Y., author and publisher of "American Woods." It is evident that the Canoe-Cedar log (Thuya gigantea) has been lying on the ground during the entire life of the hemlock (Tsuga mertensiana), which has been growing upon it, as much as 150 years. The sawed end of the cedar shows that all in sight is free from rot, except at the heart. Mr. Hough writes:

"I suppose you agree with me that the old cedar log must have lain on the ground when the hemlock seed germinated. Indeed, it must have lain there some years

Cedar Log and Hemlock Tree.

before the seed landed there. Of the size of the hemlock trunk you may judge by the one-foot rule pinned upon it, and it was at about this point that we made our cut. We cut to the central pith, and could distinctly count about 120 of the rings. Then there were a lot of rings about the center too fine to be easily counted. There must have been at least 20 or 30, showing that the tree grew very slowly at first. I would add that this hemlock tree was itself dead, as a result of a forest fire, and the residents told me it had been dead two or three years; so adding these sums together, it is safe to assert

that this cedar log must have lain on the ground at least 150 years.

"There were many other cedar logs lying about with forest trees growing above them, but this is the only one I photographed. The shingle makers were making shingles by the car load from such as they could get at.

"The reason of the great preservation of this wood I think is found in the abundant moisture of the situation. The rain-fall of the Northwest is very great. This results in a most luxuriant growth of moss, ferns, lichens, etc., over the logs, and even the trunks and limbs of the trees of the forests. The fogs and frequent showers keep this covering almost continually drenched, where the shade is dense, and the logs lying beneath are kept almost as continuously wet as though they were in the bottom of a lake."

TECHNICAL.

Manufacturing and Business.

The foundry and pattern shop of the Cooke Locomotive Works, Paterson, N. J., was destroyed by fire on April 7.

Monarch brake-beams are specified for the 70 flat cars of 70,000 lbs. capacity being built by the American Car & Foundry Co. for the Chicago Great Western.

The Bethlehem Steel Co. will, on May 1, move its offices in Chicago to larger quarters in rooms Nos. 1526 and 1521 Marquette Building, where it will continue to be represented by E. Nelson, Sales Agent.

The Eastern Granite Roofing Co. will, on May 1, move its offices from Jersey City, to the Gerken Building, 90 Chambers street, New York City. At the same time the new works of the company for making its stone surface roofing will be opened.

The Johnstone flexible staybolt has been specified for the four switching engines to be ordered by the Mexican Central. Orders have also been received recently from the following roads: Mexican, Interoceanic, Southern, Seaboard Air Line and Missouri Pacific.

It has been rumored that the entire plant of The Belle City Malleable Iron Company, at Racine, Wis., has been destroyed by fire. This rumor is not correct, as the company is in position to make deliveries of castings and to care for customers' wants. A fire in the warehouse and pattern shop delayed operations for a few days.

Willis Shaw, 626 New York Life Building, Chicago, Ill., has just issued a new list of second-hand and new machinery for sale. This pamphlet includes hoisting engines with and without boilers, side dump cars, steam shovels, steam dredges and ditching machines, rollers, scrapers, concrete mixers, drills, locomotives, freight and passenger cars, etc.

C. L. Strobel, Consulting and Contracting Engineer of Chicago, Ill., in addition to work mentioned under "Bridge Building," has under contract the extensive new foundry buildings of the Oliver Chilled Plow Works at South Bend, Ind., and the structural iron work for the extension to the Chicago Edison Company's Harrison street power house. He has just completed the iron work for the Northwestern Elevated R. R. Co.'s large power house and coal bunkers in Chicago, Ill.

Of the freight cars just ordered by the Southern Ry. 50 side-dump of 80,000 lbs. capacity ordered from the American Car & Foundry Co., and 1,000 coal cars of 80,000 lbs. capacity, ordered from the Southern Car & Foundry Co. will be equipped with Thornburgh double-spring tandem coupler attachments; and 1,000 box cars from the Mt. Vernon Car & Mfg. Co., 600 cars from the American Car & Foundry Co., 250 cars from the Southern Car & Foundry Co., and 100 cars from the Georgia Car & Foundry Co. will have Thornburgh single spring coupler attachments This is the result of efforts of the Thornton N. Motley Co., 43 John street, New York, who is the Southern Agent for the Thornburg Coupler Attachment Company.

Iron and Steel.

The United States Steel Corporation has bought the Fannie Blast Furnace at West Middlesex, from E. A. Wheeler, of Sharon, Pa., and Lloyd Reed, of Erie.

The American Bridge Co. will furnish the crown agents for the colonies of Great Britain the steel work for two deck plate girder spans, and for strengthening two other bridges on the Jamaica Government Railway.

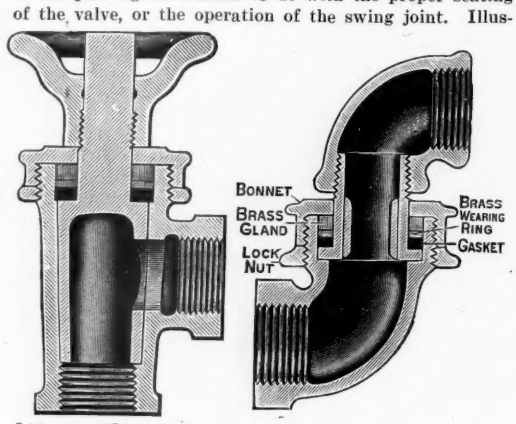
The North American Steel Co. was incorporated in New Jersey last week with a capital stock of $1,000,000, to make iron and steel. The incorporators are: Robert M. Talbott, J. S. Dale, Joseph M. Clark, H. R. Payne and Horace J. Subers.

Bids for building a twin screw steel steamer are wanted by F. Gourdeau, Deputy Minister of Marine & Fisheries, Ottawa, Ont., until May 15. The steamer is to be of the following dimensions: Length, 210 ft.; breadth, moulded, 34 ft.; depth, moulded, 18 ft.

The American Bridge Co. has established itself at Wissahickon, near Philadelphia, Pa., and most of the clerical and draughting force of the company has been brought from New York. The company has contracts for a factory at Manila, P. I., which will use 1,000 tons of steel, and for a Bessemer and open-hearth steel plant at Monterey, Mexico, to use 2,500 tons. Last month the plants in the Pittsburgh district booked orders for 17,000 tons, the greatest volume of business ever obtained by the company for any one month, or by the various plants before the consolidation.

Plug Valves and Swing Joints.

The difficulty and expense of maintaining plug valves and swing joints, where it is imperative that they be kept tight, is well known. The make of the glands and control of the packing have much to do with the proper seating of the valve, or the operation of the swing joint. Illustrated herewith is an angle plug valve that is designed to insure easy turning with fluid-tightness. The valve stem has a square extension and also a hand wheel. The bonnet has a lock ring or spanner nut below it, and the packing, which is covered at the top by a double brass gland ring, the lower portion of which is commonly called the wearing ring, can thus be adjusted at will and held positively. In the swing joint, also here illustrated, the same general arrangement of packing gland is used. The other parts are self-explanatory as illustrated. The plug valves and swing joints are among the many excellent products of the Bordo Valve Company, 113 North Twelfth street, Philadelphia, Pa.



Search Lights for Niagara Falls.

The Michigan Central has made some trials in connection with the General Electric Co. which show that Niagara Falls can be very effectively illuminated by searchlights, and if the necessary arrangements can be made, the apparatus for lighting the Falls will be installed before June. Passengers going to and from the Pan-American Exposition by way of the Michigan Central and passing the Falls at night will therefore see a very beautiful spectacle. They will also be able to see from this point the searchlight on top of the electrical tower at the Exposition over 20 miles away. Current will be furnished from the powerhouse directly below the Falls View station, and it is the intention to illuminate the Falls upon the arrival of all the night trains.

The Westinghouse Friction Draft Gear.

Up to April 1 the Westinghouse Air-Brake Company had shipped draft gears for over 200 locomotives and 10,000 cars. There remained on the books at that date orders for upward of 150 engines and 11,000 cars. The shipments include about 30 railroads.

The Torrey Ballast Loader.

Illustrated descriptions of the Torrey ballast loading machine were published in the *Railroad Gazette*, Oct. 13, 1899, and May 11, 1900. It was invented by Mr. A. Torrey, Chief Engineer of the Michigan Central Railroad, for use on branch lines where it would not pay to maintain a steam shovel to handle the amount of ballast material required for renewals. The patent rights of this machine have been bought by Fairbanks, Morse & Co., and the machines, equipped with gasoline engines, are being sold by them. The Michigan Central, the Duluth, South Shore & Atlantic and the Mississippi River & Bonne Terre railroads are among those that are now using them. The ballast loader consists essentially of a short car having an endless conveyor, and a mast upon which is mounted a double-crank shaft from which ropes depend and support scoop shovels about three times as large as the ordinary track shovel. The conveyor and crank shafts are all driven by a 5-h.p. Fairbanks-Morse gasoline engine and the shovels, thus lifted and swung, enable four shovelers to load 12 cars holding 26 cu. yds. of gravel each, in 10 hours. The arrangement makes it possible to handle small quantities of material at approximately the relative cost of steam shovel work on a larger scale.

Automatic Block Signals on the New York Central.

The New York Central & Hudson River has let to the Union Switch & Signal Company the contract for putting in automatic block signals between New Durham, N. J., and West Haverstraw, N. Y., 32 miles. This is the New York end of the West Shore road, a line on which numerous suburban passenger trains are run. The signals are semaphores, to be worked by electric motors. The signals and all the appliances will be quite similar to those which were recently put in by the Union Company on the Delaware, Lackawanna & Western and which have already been described in the *Railroad Gazette*.

Cables of the New East River Bridge.

The first wires for the New East River bridge were drawn across the river last Tuesday and were to be lifted to the top of the tower on Thursday and Friday. They were made fast over the New York towers and the free end was lifted on the Brooklyn side.

Harbor Works at Rosario.

The following is a résumé of a governmental decree:

(1) Tenders are asked for the construction and working of a commercial port (harbor works) at the city of Rosario de Santa Fe.

(2) These tenders may be made in duplicate and handed to the Argentine Legations until June 10, 1901, or to the Ministry of Public Works in Buenos Ayres until July 10, 1901. On the latter date, at 3 o'clock p. m., the opening of the bids will take place at Buenos Ayres. The conditions of the tenders, together with the plans of the contemplated work and other documents appertaining thereto, will be on view in the offices of the Ministry of Public Works, Buenos Ayres, and at the Argentine Legations in Washington, London, Paris, and Berlin.

(3) The study of the tenders is to be submitted to a council of seven persons.

An Improvement in Hollow Staybolt Iron.

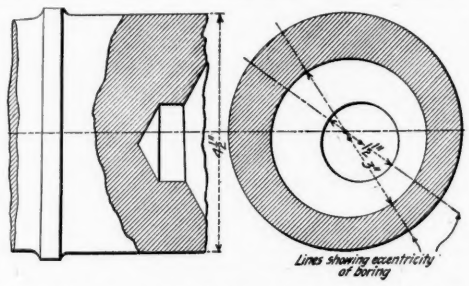
The Falls Hollow Staybolt Co. has recently put in an improved process by which hollow bars may be produced 8 to 9 ft. long of any outside and inside diameter desired. The bars, as rolled, are ready to cut and thread, which saves the cost of drilling tell-tale holes and probably produces at the same time a better result.

Train Lighting by Electricity.

In the March issue of the *Proceedings* of the St. Louis Railway Club will be found a paper on this subject by Prof. Shepardson, of the University of Minnesota. The art of lighting cars is reviewed briefly, the fundamental principles of the dynamo are considered, and the various methods of electric lighting are described with especial attention to axle lighting. This description of apparatus is the chief value of the paper. For obvious reasons costs of maintenance and of operating cannot be discussed with any satisfaction. The pamphlet may be had for 15 cents from the Secretary, Mr. E. A. Chenery, Union Station, St. Louis, Mo.

A Bad Piston Rod.

The accompanying sketch is from a broken hollow piston rod recently removed from a compound engine. As may be seen from the drawing the fracture was near the crosshead end of the rod, and from the position of centers of



rod, drill tip, and bore of the rod it is apparent that a very careless piece of shopwork was done in making the rod. The eccentricity of the bore is plain and in the language of our correspondent "the surprising part of it is that such a job should be turned out in this age, and that it should pass the inspector."

THE SCRAP HEAP.

Notes.

The Legislature of the State of Washington has adjourned without passing any general railroad laws.

The bill before the Texas Legislature to allow railroads outside the state to lease lines in Texas not over 115 miles long has been defeated in the Senate.

The Pennsylvania Steel Co. has bought the entire stock of the Spanish-American Iron Co. at Daiquiri, Santiago de Cuba, for $2,000,000, and now controls all the iron mines in the province of Santiago.

About 140 men employed in the shops of the New York Central at East Rochester struck on April 3 for recognition of their union and for an increase of pay. The company closed the shops, and one of the officers subsequently told a reporter that the work would be transferred to Buffalo and West Albany; the company had long been thinking of discontinuing the Rochester shops, but had kept them running out of consideration for the old employees.

Traffic Notes.

Wichita, Kan., has a Traffic Bureau. The Commissioner is Mr. W. J. Mann, late of Rochester, N. Y.

A Pittsburgh paper says that the ticket brokers in that city have lately closed up their offices, in consequence of a decision of the Supreme Court of the State sustaining the law prohibiting their business.

Press despatches from Chicago report that the eastbound railroads have refused to longer give to the Board of Trade the weekly statistics of shipments of flour, grain and provisions; though the Central Traffic Association will continue to give out the aggregate of the shipments by all of the roads each week.

In consequence of the inconvenience in the handling of trains which is due to the building of the new Union passenger station the different lines of the Pennsylvania road leading out of Pittsburgh announce that during the coming summer all excursion trains must start from some point outside the Union station yard. Notices are printed in the local papers telling where the trains for the different divisions will be loaded.

The Railroad Commissioners of Texas have issued revised rates for switching freight cars; for one mile or less the rate per car is $1.50; two miles, $2; over two miles, $2.50. These rates include the return of the car if empty. Special rates are prescribed at a number of cities, some higher and some lower than the standard rates. Railroad companies are required to maintain an adequate equipment and force to perform switching with reasonable despatch. The same circular forbids railroads to absorb cartage on freight at starting point or destination; but they may transfer freight by wagon from one station to another at junctions.

The Southern Pacific now runs two through express trains daily each way between San Francisco and Los Angeles. The new train, which, in each direction, starts in the morning, travels over the new Coast line, which is a good deal shorter than the old main line through the San Joaquin Valley and over the Tehachapi Mountains. The new day trains are made up of new cars, one on each train being a buffet car, in which about half the space is fitted as an eating room and the rest with ordinary seats. The Sunset Limited is also run over the Coast line, so that passengers by that train enter San Francisco without having to cross the bay by boat.

Steel Car Building.

During the month of March, the Pressed Steel Car Company built and shipped 2,609 freight cars, an average of 100 cars for each working day. The largest average for any month prior to March, 1901, was 72 cars a day. The officials of the company say that the prospects are good for even a larger output during April.

The Proposed Canadian Railroad Commission.

The proposition to establish a railroad commission for the Dominion of Canada, which was announced by the Government several months ago, is embodied in a bill, presented by Mr. Reid and now before Parliament, which is modeled closely after the Interstate Commerce Law of this country. The clauses affecting rates do not apply to traffic wholly within a single province. The number of commissioners provided for in the bill is five, and their salaries are $2,000 each.

Washington Water Supply Work.

Capt. Miller, U. S. A., the engineer officer in charge of the water supply system of the District of Columbia, has reported to the War Department on the satisfactory progress of the work of completing the Lydecker tunnel and the Howard University reservoir. The work includes cleaning and lining the tunnel, lining the connecting shafts and building the face wall, embankments, puddle core, gate house and pipe lines at the new reservoir.

The Yunnan Railroad.

Preparations are going on to resume the survey of the railroad line from Tonquin to Yunnan, stopped by the recent disturbances in that province. It is doubtful whether the Chinese will allow the survey parties to work again quietly. The Chinese officials are not at all friendly. Those who know the land and people advise that surveying should not be resumed until matters have been arranged at Pekin.

Verdict on the Bordentown Collision.

The investigation of the butting collision of passenger trains which occurred near Bordentown, N. J., Feb. 21 was concluded at Trenton, April 4, the Coroner's jury bringing in a verdict declaring the engineman and conductor responsible. The jury, furthermore, censures the railroad company for not maintaining a double track with block signals, and as this was the first time the southbound train had been run in three sections "it was evidently a new experience" to the north-bound conductor and engineman, so that "amid the contingencies of human mistake this should mitigate their blame to a certain extent."

LOCOMOTIVE BUILDING.

The Illinois Southern is in the market for four locomotives.

The Ohio Southern is reported in the market for six locomotives.

The Jamestown & Chautauqua has ordered one engine from the Brooks Locomotive Works.

The Pennsylvania Company has ordered 20 Class H 4 engines from the Pittsburgh Locomotive & Car Works.

The St. Louis & San Francisco has ordered 10 consolidation engines with 21 in. x 28 in. cylinders, and five passenger engines with 20 in. x 28 in. cylinders from the Dickson Locomotive Works.

The Pennsylvania has ordered 40 Class H C and 20 more Class F 3 (mogul) engines from the Baldwin Locomotive Works, making in all 108 engines ordered this year from the Baldwin Works.

The California & Northwestern has ordered two 10-wheel engines from the Richmond Locomotive Works. They will weigh in working order about 114,000 lbs., with 88,400 lbs. on the driving wheels and have 18-in. x 24-in. cylinders; 56-in. driving wheels; a total wheel base of 32 ft. 8 in.; 56-in. boilers with 215 tubes 2 in. in diam. and 12 ft. 11 in. long; fire-boxes, 96 in. long and 34 in. wide, and a tender capacity for 3,500 gals. of water.

The Texas & Pacific order recently placed with the Cooke Locomotive and Machine Works calls for 17 10-wheel simple freight engines and eight 10-wheel simple passenger engines for July and August delivery. The freight engines will weigh 150,000 lbs. with 122,000 lbs. on the driving wheels, and have 20-in. x 26-in. cylinders; 63-in. driving wheels, extended wagon top boilers with a working steam pressure of 220 lbs. and 280 tubes 2 in. in diam. and 13 ft. 4 in. long; fire-boxes, 123 in. long and 42 in. wide; and a tender capacity for 6,000 gals. of water and nine tons of coal. The passenger engines will weigh 156,000 lbs. with 115,000 lbs. on the driving wheels, and have 19 in. x 26-in. cylinders; 67-in. driving wheels; radial stay extended wagon top boilers with a working steam pressure of 220 lbs. and 285 tubes 2 in. in diam. and 13 ft. 9 in. long; fire-boxes 106 in. long and 42 in. wide; and a tender capacity for 6,000 gals. of water and nine tons of coal. The specifications for all include Westinghouse brakes, Goimar bell ringers, Gould couplers, Pyle National electric headlights, Monitor injectors, U. S. metallic piston rod and valve packings, Leach sanding devices, Nathan lubricators, Latrobe tires and Gold steam heating apparatus.

The Lehigh Valley order with the Baldwin Locomotive Works for 15 locomotives, referred to March 29, calls for five Atlantic type passenger, eight compound consolidation freight and two eight-wheel yard engines for May, June and July delivery. The passenger engines will weigh 165,000 lbs., with 90,000 lbs. on the driving wheels and have 20-in. x 26-in. cylinders; 80-in. driving wheels; radial stay boilers with a working steam pressure of 200 lbs. and 326 tubes 2 in. in diam., of seamless cold drawn steel; fire-boxes, Carbon steel, 9 ft. long and 7 ft. 6 in. wide; and a tender capacity for 4,500 gals. of water and 10 tons of coal. The consolidation engines will weigh 195,000 lbs., with 171,000 lbs. on the driving wheels and have 17-in. and 28-in. x 30-in. cylinders; 62-in. driving wheels; radial stay boilers with a working steam pressure of 200 lbs. and 356 tubes; fire-boxes, Carbon steel, 9 ft. 6¾ in. long and 8 ft. wide; and a tender capacity for 7,000 gals. of water and 15 tons of coal. The yard engines will weigh 145,000 lbs. and have 19-in. x 28-in. cylinders; 50-in. driving wheels; radial stay boilers with a working steam pressure of 185 lbs. and 293 tubes; fire-boxes, Carbon steel, 8 ft. long and 6 ft. wide; and a tender capacity for 4,500 gals. of water and eight tons of coal. The specifications call for Westinghouse brakes, Snow bell ringers, Sterlingworth brake-beams, Gould couplers on the passenger and freight and Tower couplers on the yard engines, Dressel headlights, Metropolitan injectors, U. S. valve and piston rod packings, Consolidated safety valves, Leach sanding devices, Nathan lubricators, Ashcroft steam gages, Gold steam heat equipment on the passenger engines, and Latrobe tires.

CAR BUILDING.

The Dairy Dealers' Despatch is reported in the market for refrigerator cars.

The American Cereal Co. is preparing specifications for 500 refrigerator cars.

The Detroit & Mackinac has ordered 150 freight cars from the Barney & Smith Car Co.

The Norfolk & Southern has ordered two passenger cars from the Jackson & Sharp Co.

The St. Louis, Troy & Eastern has ordered 18 ballast cars from the Rodger Ballast Car Co.

The H. J. Heinz Co., Pittsburgh, Pa., is having two cars built by the Middletown Car Works.

The Aurora, Wheatland & Chicago (an electric road now building) is in the market for passenger cars.

The Chicago, Burlington & Quincy has ordered 250 gondola cars from the American Car & Foundry Co.

The Anglo-American Refrigerator Co. will build at its own shops 100 refrigerator cars of 60,000 lbs. capacity.

The Pennsylvania has ordered six dining cars from the Pullman Co. Additional orders for cars may be placed later.

The Copper Range has ordered 20 hopper bottom ore cars of 80,000 lbs. capacity from the American Car & Foundry Co.

The California & Northwestern has ordered 40 cars from the American Car & Foundry Co. They will be built at Huntington.

The Northern Pacific has ordered 152 stock cars from the American Car & Foundry Co., instead of from the South Baltimore Car Works, as reported in our issue of March 29.

The Canadian Pacific will build at its own shops the following equipment: Fifty-five flat cars of 60,000 lbs. capacity; six fruit express cars, at Perth; five flat cars, six baggage and express cars and 10 coaches at Hochelaga.

The Pennsylvania Company has ordered eight Class P K and nine Class O K combination cars from the Jackson & Sharp Co., and two dining cars from the Pullman Co. Probably orders for more equipment will be placed later.

The Marquette & Southeastern has ordered 100 flat cars of 80,000 lbs. capacity from the Pressed Steel Car Co. They will measure 43 ft. long, 9 ft. 3 in. wide and 3 ft. 8½ in. high and have Westinghouse brakes and Tower couplers.

The Elgin, Joliet & Eastern has ordered 50 coal cars of 100,000 lbs. capacity from the American Car & Foundry Co. They will weigh 38,000 lbs., measure 41 ft. 6 in. long outside, and have Corning brakeshoes, Buckeye couplers, Scott springs, Griffin wheels and McCord journal boxes.

The St. Louis & San Francisco has ordered 500 box and 150 furniture cars of 60,000 lbs. capacity, 500 coal cars of 80,000 lbs. capacity, 15 cabooses, five chair cars, five coaches and four baggage cars from the American Car & Foundry Co. The box cars will be 36 ft. long, furniture cars 50 ft. long, and the coal cars 34 ft. long.

The St. Louis, Iron Mountain & Southern has ordered four postal and six baggage cars from the American Car & Foundry Co., for August delivery. They will weigh 75,000 lbs., measure 60 ft. long, 9 ft. 2½ in. wide and 9 ft. 4 in. high, inside, and have National brake-beams, Westinghouse brakes, National couplers, Gold heating system, McCord journal boxes and journal box lids and Pintsch light.

The Atchison, Topeka & Santa Fe, as reported last week, has ordered 15 wide vestibule chair cars from the Pullman Co. They will have a seating capacity for 68 passengers and measure 70 ft. long, 10 ft. wide and 7 ft. 7⅝ in. high, and have National hollow brake-beams, Westinghouse brakes, National couplers, Forsyth curtain fixtures with Pantasote materials, Baker heating system, Pintsch light and Standard steel platforms. The road will also build at its Topeka shops 250 tank cars of 80,000 lbs. capacity, to be finished in May. They will weigh 37,000 lbs., measure 35 ft. long, 6 ft. 6 in. wide and 12 ft. high to top of door, and have Metropolitan brakes, Tower couplers and Shickle, Harrison & Howard trucks.

The Southern has ordered, in addition to the cars stated last week (600 ventilated box, 400 plain box and 250 double hopper coal cars from the Mt. Vernon Car Mfg. Co.; one 60-ft. baggage, five mail and baggage, two combination passenger, mail and baggage, 50 ballast, 100 furniture and 500 box cars from the American Car & Foundry Co.; 1,000 double hopper coal, 50 refrigerator, 100 coke and 100 stock cars from the Southern Car & Foundry Co.), 1,000 double hopper coal, 50 refrigerator, Vernon Car Mfg. Co.; 100 flat cars, Georgia Car & Foundry Co.; seven narrow vestibule passenger and eight wide vestibule passenger coaches from the Pullman Co.; and five passenger and baggage cars from the Barney & Smith Car Co. The specifications for the 1,000 box cars ordered from the Mt. Vernon Car Mfg. Co. call for cars of 60,000 lbs. capacity for September delivery. They will measure 40 ft. long, 8 ft. 2½ in. wide and 7 ft. 1¾ in. high inside, and have Simplex bolsters, Sterlingworth brake-beams, Westinghous brakes, Janney couplers, Jones door fastenings, Thornburg coupler attachments, cast-iron journal boxes with pressed steel lids, Chicago-Cleveland roofs and Scott springs.

BRIDGE BUILDING.

ALBANY, N. Y.—A bill is before the Legislature authorizing the Union Bridge Co., within 60 days after the passage of the act, to have plans and specifications made for an iron or steel bridge across the Hudson River upon the site of the present structure now owned by the company.

BALTIMORE, MD.—The Western Maryland R. R. is reported to have decided to replace all the light bridges with heavier structures.

BATESVILLE, MISS.—The Board of Supervisors of Panola County want estimates on rebuilding about 200 to 225 ft. of iron span of bridges at Batesville. T. T. O'Bryant, Clerk.

BEAVER, PA.—The Beaver County Commissioners will sell $55,000 of bridge bonds on April 9.

BELLEVUE, KY.—A viaduct to cross Mill Bottoms at a cost of $25,000 is under consideration by the citizens.

BENWOOD, W. VA.—The Pennsylvania Steel Co., according to report, has the contract for the Baltimore & Ohio bridge over the Ohio River to Bellaire, Ohio.

BURNSIDE, N. C.—The North Carolina Legislature has passed a bill authorizing Yancey County to issue bridge bonds.

CANAJOHARIE, N. Y.—John M. Farley, Civil Engineer of White Plains, N. Y., informs us that the Town Boards of Canajoharie and Palatine Bridge will soon receive bids for a riveted double Warren through truss bridge, 486 ft. long, over Mohawk River. It will have brick and concrete floor. Address B. F. Spraker, of this place.

CHARLOTTE, N. C.—The Mecklenberg County Commissioners have ordered a new iron bridge over Steele Creek, and repairs made to other bridges damaged recently.

DELPHOS, OHIO.—C. L. Strobel, Contracting Engineer, Chicago, Ill., has been awarded the contract for a lift bridge of a new type to be built for the Pittsburgh, Fort Wayne & Chicago over the canal at Delphos. Mr. Strobel is also building a double-track swing bridge over the Calumet River for the Calumet Western Ry., and is finishing the Randolph street viaduct in Chicago, Ill., for the Pennsylvania Company.

DOVER, DEL.—The Levy Court will soon want bids for a new bridge over Silver Lake, north of Dover.

DUBUQUE, IOWA.—The Dubuque & Wisconsin Bridge Co. is reported to have contracted for its wagon bridge across the Mississippi River, with the Toledo Bridge Company, of Toledo, Ohio. The bridge will be 55 ft. above high water mark and 1,100 ft. long, exclusive of approaches. The main spans will be 380 ft. long.

EASTON, PA.—The Commissioners of Lehigh and Northampton counties will receive bids on April 16, at the courthouse in Easton, for a steel bridge on the site of the structure over Monocacy Creek, destroyed several weeks ago. The new structure will be 46 ft. wide and over 100 ft. long. The plans were made by A. J. Cooper, of Easton.

FREDERICTON, N. B.—The Berlin Iron Bridge Co. (American Bridge Co.) has contracted to furnish the Province of New Brunswick, Canada, four steel bridges. There will be required four 63-ft. riveted spans, one 150-ft. through pin-connected span, one 200-ft. deck pin-conected span, and one 80-ft. deck pin-connected span.

FREEPORT, ILL.—The following bids were received, March 27, for a three-span steel bridge across Pecatonica River at Stephenson street: Clinton Bridge & Iron Works, Clinton, Iowa, $19,899 and $20,000; Massillon Bridge Co., Massillon, Ohio, $19,949; King Bridge Co., Cleveland, Oho, $19,000; Wisconsin Bridge & Iron Co., Milwaukee, Wis., three bids from $15,000 to $19,500; American Bridge Co., six bids, from $15,720 to $25,600; Freeport Bridge Co., Freeport, Ill., $19,990; Modern Steel Construction Co., Waukesha, Wis., three bids from $15,300 to $24,000.

IRON MOUNTAIN, MICH.—The Boards of Supervisors of Dickinson County, Mich., and Marinette County, Wis., are considering building a highway bridge over the Menominee River.

KANSAS CITY, MO.—The Union Pacific and the Chicago, Rock Island & Pacific are considering a viaduct across the tracks at Tenth street, but we are told nothing is decided.

LILLINGTON, N. C.—A bill has passed the North Carolina House authorizing Harnett County to issue bridge bonds.

MCCONNELLSVILLE, OHIO.—It is reported that bids are wanted, April 30, for a three-span bridge over Muskingum River, each span to be 125 ft., with 18-ft. roadway and two 6-ft. walks. The plans are on file with the Osborn Engineering Co., Cleveland, Ohio.

MEADE, KAN.—Bids are wanted, April 13, according to report, for two iron bridges, 60 and 80 ft. each. Address W. C. Osgood, at this place.

NEWARK, N. J.—The Pennsylvania R. R. has let a contract to B. M. & J. F. Shanly Co. for the masonry work on the first and third sections for the track elevation through Newark. The work consists of building retaining walls and bridge foundations.

NEW YORK, N. Y.—The Commissioners of the New East River bridge are advertising for proposals to be opened during the afternoon of April 25, at their office in New York City, for the suspended superstructure of the New East River bridge, as mentioned on another page and in our advertising columns this week.

A bill has been introduced in the State Legislature providing for a bridge over the Bronx River between the Williamsbridge and Woodlawn stations on the New York & Harlem R. R., to connect with Second street and not to cost more than $200,000.

The Department of Bridges is advertising for bids for the labor, material and plant necessary for building the tower foundation in Brooklyn for East River Bridge No. 3. This work was described and illustrated in the *Railroad Gazette* March 1, p. 138, and bids were opened on March 11, but were rejected. The new bids will be opened on Monday, April 22.

The Governor has signed the bill for the depression of the Long Island Railroad tracks on Atlantic avenue, Brooklyn. General plans were approved by the Department of Public Works some time ago.

NORFOLK, VA.—At a meeting of the Southern Branch Drawbridge Co., at Norfolk, the President and Treasurer were authorized to contract at once for the proposed bridge over the Southern Branch of Elizabeth River. R. Richardson is President and H. L. Page, Secretary and Treasurer.

PHILADELPHIA, PA.—A bill has been introduced in the Council providing for bridges as follows: On the line of Hunting Park avenue, over the Richmond Branch of the Philadelphia & Reading; a bridge on the line of Front street and over the Connecting Ry. (P. & R.); on the line of Erie avenue, over the Richmond Branch (P. & R.); on the line of Allegheny avenue, over the Connecting Ry.; and bridges over the P. & R., Richmond Branch, between Glenwood and Sedgley avenues.

PITTSBURGH, PA.—The Pennsylvania will make some extensive improvements on the line of the Pittsburgh, Virginia & Charleston, which include abolishing a large number of grade crossings. The Council passed the track elevation ordinance on April 8.

PORTUGAL.—A report says two bridges are soon to be built across the River Douro, in Portugal. One is to be at Piconho, to carry a narrow gage railroad. The other is to be at Pinhao. Further particulars may be obtained from the Bureau of the Directorate of Public Works and Mines, Lisbon.

PRESIDIO DEL NORTE, MEX.—According to report, the Kansas City, Mexico & Orient has let contracts for building part of the road and will soon let a contract for a bridge over the Rio Grande River at this place between the United States and Mexico.

READING, PA.—The Reading Bridge & Warehouse Co. has let a contract to Nelson & Buchanan Co., of Pittsburgh, for the steel and iron work of the bridge to be built over the Schuylkill River at the foot of Sixth street. A report says the County Commissioners are asked to build a bridge at this site.

ST. CATHARINES, QUE.—The Quebec & Lake St. John Ry. has let a contract to the American Bridge Co. for the superstructure of a bridge near St. Catharines, crossing the Jacques Cartier River on the new location of the railroad. It is a steel bridge 450 ft. long and about 60 ft. above the river, consisting of three riveted truss spans, with short girder approaches, and is being built to the heaviest specifications of the Dominion Government. The substructure is being built by Joseph Paquet.

ST. JOSEPH, MICH.—It has been voted to issue $10,000 bonds for the viaduct over Michigan street. It will be about 400 ft. long and have a 30-ft. roadway. C. S. Rigby, City Engineer.

SPRINGFIELD, MASS.—Plans were made a short time ago to secure an estimate of the cost of a bridge over the Connecticut River. According to a bill passed by the Legislature, the minimum width of the bridge is to be 62 ft., 50 ft. roadway, with two 6-ft. walks, and the maximum width 69 ft., 57-ft. roadway and 12-ft. walks. The prices are on different kinds of roadbed:

	Minimum width.	Maximum width.
Plank base for roadway:		
Superstructure	$170,000	$190,000
Substructure	60,000	75,000
Total	$230,000	$265,000
Concrete base:		
Superstructure	$220,000	$255,000
Substructure	60,000	75,000
Total	$280,000	$330,000

The amount available for the structure will be about $300,000, after deducting for the cost of property damages. The bill is with the Mayor for approval.

SUMMERVILLE, PA.—J. C. Whitla, President of the Clarion & Summerville Ry., 314 Fourth avenue, Pittsburgh, announces that the contract for the steel bridge required by his railroad will be let after April 20.

SYRACUSE, N. Y.—On the afternoon of April 6 the James street bridge over the Oswego Canal collapsed with a trolley car. The bridge was about 80 ft. long and 60 ft. wide.

TIMBERVILLE, VA.—We are told that the bridge over the Shenandoah River for the Southern Ry. comprises only two plate girders which are to replace an old Howe truss which was burned. (March 22, p. 208.)

TOLEDO, OHIO.—According to report, bids will soon be wanted for a steel drawbridge about 1,500 ft. long over Maumee River for the Toledo Terminal Railway Co. H. E. Riggs, Consulting Engineer.

WASHINGTON, D. C.—The Commission to select a site and formulate plans, etc., for a highway bridge over the Potomac River, at least 500 ft. above the Long Bridge, gave a number of hearings last week. The Pennsylvania Railroad submitted plans for its proposed new railroad bridge which provides for the use of the present approach of the Long Bridge on the Washington side, and for an approach about 200 ft. above the present approach on the Virginia side. Col. Charles J. Allen, Corps of Engineers, U. S. A., Chairman of the Commission, will have a number of plans made to be considered at the next meeting of the Commission.

WOOLWICH, ME.—We are told that the Maine Central has let the contract for the plate girder bridge at this place to the New England Structural Co.

WYTHEVILLE, VA.—We are told that the American Bridge Co. has the contract from the Norfolk & Western for replacing the old iron bridge of four spans by a heavy structure over Reed Creek.

Other Structures.

ALBERT LEA, MINN.—The Burlington, Cedar Rapids & Northern will build a new passenger station in the eastern part of this city, also a freight station, roundhouse, shops and additional side tracks.

BLAIR, PA.—The Foster-Miller Engineering Co. has a contract from the Crucible Steel Co. of America for building 12 50-ton open-hearth furnaces, and for other work for the plant of the St. Clair Steel Co., to be built at Blair.

BUFFALO, N. Y.—Contracts are soon to be let for a new foundry to be built for the New York Car Wheel Works at Forest avenue and the New York Central tracks. The plans are finished. The foundry will be 140 x 500 ft., and will have a daily capacity of 700 wheels.

CHESTER, PA.—The Directors of the Seaboard Steel Casting Co. have authorized the building of a large warehouse and wharf.

CHICAGO, ILL.—Plans have been made by Architects Frost & Granger, The Temple, Chicago, for remodeling the passenger station of the Chicago, Rock Island & Pacific and the Lake Shore & Michigan Southern on Van Buren street, between Pennsylvania avenue and Sherman street.

DENISON, TEXAS.—The St. Louis & San Francisco will build at once a new passenger station here. It will be on Main street, about 300 ft. east of the present union station.

The Missouri, Kansas & Texas and the Houston & Texas Central have plans made for remodeling the union passenger station and building a 60-ft. extension.

LEBANON, PA.—The Cornwall R. R. will soon build a new roundhouse in Lebanon.

LONG ISLAND CITY, N. Y.—The coal pockets of the Long Island R. R., situated on Newtown Creek in the yard at Long Island City, were burned on April 7. The structure was about 175 ft. long.

MONTREAL, QUE.—The Harbor Commissioners have received a proposition from J. R. Booth of the Canada Atlantic Ry., who proposes to place a grain elevator in the harbor to cost $850,000.

NEW YORK, N. Y.—The Armory Board will soon advertise for new bids for building the Second Naval Battalion Armory in Brooklyn. The appropriation is $60,000 and the lowest bidder was Thomas B. Carlin, at $63,494.

NICETOWN, PA.—The Philadelphia & Reading is having plans made for a new passenger station at Nicetown.

PETOSKEY, MICH.—Regarding the report that the Grand Rapids & Indiana will build a new station at this place at a cost of $35,000, we are told that nothing will be done at present.

PHILADELPHIA, PA.—Plans are said to be out for passenger stations to be built for the Pennsylvania R. R., one at Lansdowne, another at Millsboro, and another at Frankford. Bids are being received.

PITTSBURGH, PA.—The Pennsylvania has let a contract for the steel superstructure for the train shed at the union station in Pittsburgh to the American Bridge Co. The shed will be 256 ft. wide and 700 ft. long, and will have 12 tracks. It will require about 2,200 tons of steel which will be delivered within 60 days.

POQUONOCK, CONN.—According to report, the New York, New Haven & Hartford is having plans made for new ice houses at this place, near New London; also for a roundhouse, turntable and coal sheds.

ST. JOSEPH, MO.—In connection with the plans of the Chicago, Burlington & Quincy to make extensive changes in the yard facilities ordered in the near future, the plans include a new roundhouse and freight depot.

ST. LOUIS, MO.—Fire destroyed the plant of the St. Louis Elevator & Storage Co. at the foot of Biddle street on April 7, causing a damage of about $500,000. The elevator had a capacity of 250,000 bushels, and at the time of the fire contained 700,000 bushels of wheat and 100,000 bushels of corn.

STAMFORD, CONN.—The Yale & Towne Manufacturing Co. inform us that they are to consolidate the plants now located at Stamford and Branford, by enlarging the Stamford plant sufficiently to accommodate the work now done at Branford. The principal buildings to be built during this year will be an iron foundry about 375 x 140 ft., of steel construction, a five-story steel and brick building 134 x 55 ft., and a two-story brick and steel building, 150 x 55 ft., both for manufacturing purposes, and other buildings of lesser importance. The work is not yet under contract, but it is expected that ground will be broken about May 1.

TORONTO, ONT.—Arrangements have been made for building in the northern part of Toronto a large foundry works for the Canada Foundry Co., a constituent company of the Canadian General Electric Co. As soon as plans are made it is said that contracts will be let.

WASHINGTON, D. C.—Plans are being prepared by Mr. Bruce Price, Architect, of New York, for a 10-story building to be built by the Messrs. Tyssowski at the northeast corner of Fifteenth and G streets N. W., opposite the Treasury Department. The Pennsylvania R. R. ticket offices will occupy the first story of the new building, which is to be of steel, granite and brick.

MEETINGS AND ANNOUNCEMENTS.

(For dates of conventions and regular meetings of railroad associations and engineering societies see advertising page xii.)

St. Louis Railway Club.

The annual meeting of the St. Louis Railway Club will be held at the Southern Hotel at 3 o'clock on Friday, April 12. Officers will be elected for the coming year. A paper by Mr. H. C. Alford on "The Relative Merits of Paints From a Chemist's Point of View," deferred at the March meeting, will be read.

New England Railroad Club.

The officers of the New England Railroad Club elected for the year 1901, are: President, T. B. Purves, Jr., Superintendent of Rolling Stock Boston & Albany R. R., Springfield, Mass.; Vice-President, P. M. Hammett, Assistant Superintendent of Motive Power Boston & Maine R. R.; Secretary, Edward L. Janes, B. & A. R. R., P. O. Box 663, Springfield, Mass.; Treasurer, Charles W. Sherburne, 53 Oliver street, Boston, Mass.

Institute of Mining Engineers.

The eighty-first meeting of the American Institute of Mining Engineers will be held in the City of Mexico early in November next. Mr. Theodore Dwight, Assistant Treasurer of the Institute, has undertaken to organize an excursion party to go and return by special train. For this enterprise he is personally responsible and communications concerning it should be addressed to him at 99 John street, New York city. It is proposed to take a complete train to start from Chicago about Nov. 1 and return about Dec. 1. This train will be side tracked at all places visited, and will be available as a hotel during the entire journey. The trip of about 30 days is expected to cost $250 for each person. This low cost has been made possible by the low rates given by the railroad companies for hauling the special train.

International Association for Testing Materials.

The Council of the International Association at its spring meeting at Vienna decided unanimously to hold the next Congress of the Association in Buda-Pesth from the 9th to the 14th of September, 1901. The Council can assure the members of the Association that this Congress will prove of especial interest. A series of interesting technical papers will be read and many important problems discussed; besides the reports of the chairmen of technical committees of the Association will be laid before the congress and a number of urgent affairs relating to organization and business matters, elections, etc., will have to be considered. In order to enable the central office of the Association as well as the local committee at Buda-Pesth to prepare their arrangements in due time, it is desirable for the members of the Association to notify, as soon as possible, their intention of attending the Congress by addressing the Members of Council, respectively, of their own country. Prof. Henry M. Howe, Columbia University, New York, is Chairman of the American Section.

PERSONAL.

(For other personal mention see Elections and Appointments.)

—Mr. John Wellington Branning, President of the Wellington & Powellsville Railroad, also of the Branning Manufacturing Company, died at his home in Edenton, N. C., March 19, aged 54 years.

—The new Board of Railroad Commissioners in Kansas, provided by the law recently passed, consists of Mr. A. D. Walker, Republican, of Holton; Mr. D. W. Finney, Republican, of Neosho Falls, and Mr. J. N. Fike, Democrat, of Colby. Mr. Walker will serve for three years, Mr. Fike for two and Mr. Finney for one year.

—Capt. W. B. Gordon, Ordnance Department, U. S. Army, has been appointed Professor of Natural and Experimental Philosophy at the Military Academy at West Point, in accordance with the wish of the late Prof. Michie, expressed before his death. Capt. Gordon was appointed from Pennsylvania and graduated from the Military Academy in 1873. The position which he is now to fill is the one recently declined by Capt. Crozier.

—Major William M. Black, Corps of Engineers U. S. Army, has been detached from duty at Havana, Cuba, and ordered to Willett's Point, New York, where he will relieve Major J. G. D. Knight, now commanding the Third Battalion of Engineers, the U. S. Engineer School, the Engineer Depot and on other duties. Major Knight is ordered to Chattanooga, Tenn., to relieve Major D. C. Kingman, who is ordered to Cleveland, Ohio. Major S. M. Mansfield, now at Cleveland, is ordered to New York City.

—Mr. J. M. Barr, Third Vice-President of the Atchison, Topeka & Santa Fe, who is to become Vice-President and General Manager of the Seaboard Air Line, began his railroad career as a messenger boy in 1871, on the Pennsylvania. In 1888, he became Superintendent of the Wyoming & Nebraska Divisions of the Union Pacific, and in 1890 Division Superintendent of the Chicago, Milwaukee & St. Paul. Five years later he was appointed General Superintendent of the Great Northern and resigned this position in 1897, to become Vice-President of the Norfolk & Western, and in April of the same year assumed the duties of General Manager. Mr. Barr became connected with the Atchison, Topeka & Santa Fe as Third Vice-President in 1899, being elected to this position on the death of Mr. Higginson. The date on which Mr. Barr will assume his new duties has not yet been announced.

—Mr. H. Rohwer, Chief Engineer of the Missouri Pacific, was born in the Province of Holstein, Germany, in 1847. He graduated from the schools of Hamburg with honors and in recognition of this was given the privilege of a six months' volunteership on the railroads in East Holstein. After being graduated from the Polytechnic High School at Hanover, Germany, in 1869, he sailed for the United States. He was at one time topographer, draughtsman, engineer on construction of the Burlington & Missouri River (C., B. & Q.), and in 1873 was appointed Acting Chief Engineer of the Omaha & Southwestern. For two years (1881-1883), he was Assistant Engineer of the Oregon Short Line and in 1883 was appointed Resident Engineer of the same road, in which capacity Mr. Rohwer built the tunnel at Hodges' Pass across the Wasatch Mountains on the western border of Wyoming. In 1885 he located and built the Omaha Belt Line and in 1887 took the position of Assistant Engineer on the Missouri Pacific, with headquarters at Sedalia, Mo.

—Mr. George F. Baer, the new President of the Philadelphia & Reading Railway, was born in Somerset County, Pa., Sept. 26, 1842, and was educated at the Somerset Institute, the Somerset Academy and the Franklin and Marshall College. In 1861 he, with his brother, Henry, became owner of the Somerset *Democrat*. The following year he raised a company of volunteers, of which he was capatin, and served in Humphrey's Division of the Army of the Potomac. Mr. Baer joined the army at the second battle of Bull Run and took part in all the engagements up to and including Chancellorsville, when he was detailed as the Adjutant General of the Second Brigade. After his return from the war he resumed his legal studies and was admitted to the bar in 1864. Mr. Baer became connected with the Reading Companies in 1870, when he became counsel for the Philadelphia & Reading. He has been for years the confidential legal adviser of Mr. Morgan in Pennsylvania, and when the Philadelphia & Reading was reorganized, after the receivership of 1893, took a prominent part in that reorganization and again became identified with the Reading management.

ELECTIONS AND APPOINTMENTS.

Chicago, Burlington & Quincy.—Jacob Kastlin, heretofore General Foreman Locomotive Repairs at West Burlington, Iowa, has been appointed Assistant Master Mechanic, with headquarters at Galesburg, Ill.

Chicago Great Western.—H. B. Merriam has been appointed Division Engineer, with headquarters at Dubuque, Iowa, succeeding F. S. Hunt, resigned. (See St. Joseph & Grand Island.)

Chicago, Milwaukee & St. Paul.—J. C. Hain, heretofore Assistant Engineer of Bridges and Buildings, has been appointed Engineer of Permanent Construction of Bridges and Buildings, with headquarters at Chicago, Ill., succeeding W. A. Rogers, resigned.

Choctaw, Oklahoma & Gulf.—E. C. Tomlinson has been appointed Division Superintendent, with headquarters at South McAlester, Ind. T.

Colfax Northern.—The officers of this company, referred to in the Construction column, are: President, Thomas N. Hooper, St. Paul; Vice-President, Leland Windsor, Des Moines, Iowa; Secretary and Treasurer, Frank B. Hooper, St. Paul.

Columbus, Wellston & Southern.—J. G. Reeves, heretofore Vice-President, has been elected President and General Manager, succeeding the late W. H. Stevenson.

Empire Coal.—The officers of this company, referred to in the Construction column, are: President, L. G. Everist, Des Moines, Iowa; Secretary, A. E. Hollingsworth, Des Moines; Chief Engineer, L. F. Wakefield, Des Moines.

Fremont, Elkhorn & Missouri Valley.—J. A. Kuhn has been appointed General Freight Agent, succeeding K. C. Morehouse, resigned. Effective April 1.

Great Northern.—A. Stewart has been appointed Resident Engineer, at Spokane, Wash., succeeding H. W. Edwards, resigned. E. R. McNeill succeeds Mr. Stewart as Resident Engineer at Havre, Mont.

Lake Shore & Michigan Southern.—A. H. Smith, heretofore Division Superintendent at Toledo, Ohio, has been appointed Assistant General Superintendent, with headquarters at Cleveland. J. R. Horgan, heretofore Trainmaster, has been appointed Superintendent of the Michigan Division. Effective April 1.

Long Island.—At a meeting, held April 9, the following new Directors were elected: T. DeWitt Cuyler, James H. Hyde and Samuel S. Dennis.

Louisville & Nashville.—A. W. Graham has been elected First Vice-President, succeeding Y. Van den Berg, resigned. C. B. Compton, heretofore General Freight Agent, has been appointed Traffic Manager, succeeding Mr. Graham.

D. M. Goodwyn, heretofore Assistant General Freight Agent, has been appointed General Freight Agent, succeeding Mr. Compton.

Missouri, Kansas & Texas.—A. B. Manning has been appointed Superintendent of Bridges and Buildings of this company and the Missouri, Kansas & Texas of Texas, with headquarters at Denison, Texas.

Missouri Pacific.—E. J. Ward has been appointed Division Superintendent at Osawatomie, Kan., succeeding W. L. Dunaway, resigned. C. R. Nedrow succeeds Mr. Ward as Division Superintendent at Wichita, Kan.

Northern Pacific.—G. B. Cliff has been appointed Division Superintendent, with headquarters at Seattle, Wash.

North Pacific Coast.—W. F. Russell, Traffic Manager and General Freight and Purchasing Agent, with headquarters at San Francisco, Cal., has resigned.

St. Joseph & Grand Island.—F. S. Hunt, heretofore Division Engineer of the Chicago Great Western, has been appointed Chief Engineer of the St. J. & G. I., succeeding H. Fernstrom.

Seaboard Air Line.—J. M. Barr, heretofore Third Vice-President of the Atchison, Topeka & Santa Fe, is to become Vice-President and General Manager of the S. A. L.

Southern Pacific.—At a meeting of the stockholders, held April 3, the following new board was elected: T. J. Coolidge, Jr., George J. Gould, E. H. Harriman, Edwin Hawley, Charles M. Hays, H. E. Huntington, James H. Hyde, Otto H. Kahn, J. W. Mackey, D. O. Mills, Winslow S. Pierce, J. H. Schiff, James Speyer, James Stillman and Charles H. Tweed. Messrs. Harriman, Kahn, Gould, Coolidge, Pierce, Stillman, Hyde and Schiff, the new Directors, are also Directors of the Union Pacific.

Tallulah Falls.—W. S. Erwin has been appointed General Freight and Passenger Agent.

Texas & Pacific.—At a meeting, held April 5, the following officers were elected: President, G. J. Gould; First Vice-President and General Manager, L. S. Thorne; and Second Vice-President, Frank J. Gould. The office of Third Vice-President was abolished.

Texas Midland.—A. G. Wells has been appointed Acting Chief Engineer, succeeding M. Duvall, Chief Engineer, resigned.

RAILROAD CONSTRUCTION.

New Incorporations, Surveys, Etc.

AKRON & BARBERTON.—This company was incorporated in Ohio, April 5, with a capital stock of $15,000, to build a steam railroad from a point on the north side of Akron, running around the north and west side of the city to Barberton. The incorporators are: Chas. W. French, Geo. R. Hill, E. H. Gibbs, C. D. French and E. C. Hurd. The same men incorporated the Akron South Side Belt of Akron, to build a steam railroad on the east side of Akron, running by way of the east and south sides to Barberton.

AKRON SOUTH SIDE BELT.—See Akron & Barberton.

ALACULSY.—This line is projected through Fannin, Gilmer and Murray Counties, Ga., to reach lumber lands, and it is to be about 26 miles long. M. S. Squires is President, and C. A. Wilkinson, Secretary, both of Binghamton, N. Y.

ARKANSAS ROADS.—The Gifford-Frisby Lumber Co. of Jamestown, N. Y., is reported building a lumber road seven miles long from Round Pond, on the Choctaw, Oklahoma & Gulf, north into timber lands. Grading is completed.

ARLINGTON, WALTHAM & CONCORD STREET.—Both Houses of the Massachusetts Legislature have refused the petition of this company to build an electric railroad through the cities named. The company was to be incorporated, with a capital stock of not more than $300,000, and asks for right of way through the towns of Arlington, Belmont, Waltham, Lexington, Lincoln and Concord. Henry C. Long and ex-Senator Henry S. Milton are among the incorporators. (April 5, p. 245.)

AURORA, WHEATON & CHICAGO.—M. J. Mandelbaum & Co., of Cleveland, Ohio, are reported to have made arrangements for the sale of $3,000,000 of this company's bonds for the proposed connecting line west of Chicago. Among the roads to be included are the Batavia & Eastern, the Elgin City, Carpentersville & Aurora, the Aurora & Geneva, the Aurora Street and the Geneva, Batavia & Southern. The road, it is said, will enter Chicago over the 48th street branch of the Metropolitan West Side Elevated. J. H. Hood, of Aurora, and L. J. Wolf, of Cleveland, Ohio, are said to have been instrumental in bringing about the consolidation. (Railroad News, Aurora Street, April 5, p. 246.)

BALTIMORE & OHIO.—W. A. Dodge, of Buffalo, N. Y., has taken the contract for building the extension for the J. R. Droney Lumber Co., of Olean, N. Y., from Confluence, Pa., to run southeast 25 miles via Hardinsville, Dumas, Listonburg and Unimas, Pa., to Somerset County on the Maryland line, and thence to Garrett County, Md. (Construction Supplement, March 8, 1901.)

CAMPBELL'S CREEK.—This line is projected from the Kanawha River in West Virginia to mines 13 miles. It is graded for two miles from the river. Surveys are made for additional work and bids are being received. E. W. Knight is President, J. E. Dana, General Manager, and M. W. Venable, Chief Engineer, all of Charleston, W. Va.

CENTRAL OF VIRGINIA.—This company has been organized in Harrisonburg, Va., with W. H. Ridland as President, to build a railroad from Rockingham County to the West Virginia State line.

CHEAT VALLEY.—The company will build this year from Whetsell's, W. Va., north about seven miles to Albrightsville.

CHICAGO, DUBUQUE & PACIFIC.—This company was incorporated in Iowa, April 3, by Iowa men, to build a railroad from Dubuque southwest through Delaware, Linn, Benton and Tana counties to Toledo, Iowa. The principal place of business is Dubuque.

CHICAGO, INDIANA & EASTERN.—Right of way is being asked through the city of Muncie, Ind., for the proposed extension of this line, now completed from Converse, Ind., to Muncie. H. E. Drew, of Matthews, Ind., is General Manager. (Construction Supplement, March 8, 1901.)

CINCINNATI, HAMILTON & DAYTON.—Right of way is reported being secured for the Indiana, Decatur & Western extension from Decatur, Ill., west about 40 miles to Springfield.

CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS.—An officer writes that the Big Four intends extending its present double track from Columbia, Ohio, to Grafton, 7.3 miles; from Wellington to Greenwich, 18.3 miles, and from Shelby to Crestline, 8.5 miles. Double passing sidings to accommodate 80 cars each are being established at La Grange, Shiloh, Pemberton and Houston, Ohio, and at a point between Anderson and Pemberton, Ind. (April 5, p. 245.)

COLFAX NORTHERN.—This company has been organized in Iowa to buy the property of the Iowa Northern from Colfax to Valeria, 5.93 miles, and to extend the line from both terminals. It is to be operated by the Chicago Great Western. The incorporators are: Thomas N. Hooper, Jr., St. Paul; W. R. Prouty, Leland Windsor and W. S. Rogur, of Des Moines, Iowa.

DETROIT & MACKINAW.—Surveys are reported in progress for a cut-off just south of Harrisville, Mich.

DETROIT & TOLEDO SHORE LINE.—Last week we noted the purchase of the control of this property by W. B. Strang of Toledo, Ohio. It is understood that it is in the interest of the Everett syndicate of Cleveland, which has recently acquired the Detroit Street Ry. system and proposes to use the Detroit & Toledo Shore Line as a part of its proposed electric road from Celevland to Detroit. The syndicate is credited with further plans for an electric route from Buffalo to Chicago via Cleveland, Toledo and Detroit.

DULUTH, VIRGINIA & RAINY LAKE.—This company was incorporated in Minnesota, April 3, with a capital stock of $1,500,000, to build a railroad from Virginia north along the west end of Vermilion Lake and via Ash Lake to Koochiching in the Rainy Lake country. The incorporators are: Wirt H. Cook, M. S. Cook, William D. Bailey, F. W. Heimick and Henry Turrish, who are connected with the Cook & Turrish Lumber Co., of Duluth.

EAST LOUISIANA.—Surveys are reported completed, right of way secured and contracts will be let soon for the Louisiana Eastern extension from Covington, La., north 28 miles to Franklinton. (Construction Supplement, March 8, 1901.)

EL PASO TERMINAL ASSOCIATION.—This company has been organized by men connected with the Arizona & Southeastern, to build terminals at El Paso, Tex.

EMPIRE COAL.—This line, heretofore noted under Iowa roads (March 29, p. 230), is located, right of way is secured, contracts are let and grading is in progress. It is to run from Tracy, Marion County, Iowa, to a coal shaft near Marysville, eight miles. Price Bros., of Oskaloosa, have the contract. There are 150 teams at work. The maximum grade is 1 per cent. The officers are given under Elections and Appointments. (Official.)

ESCANABA & LAKE SUPERIOR.—Surveys were begun April 1 and contracts will be let about May 15 for clearing, grading and bridging the proposed extension from Cornell, Mich., northwest 22 miles. (Construction Supplement, March 8, 1901.)

EUREKA & KLAMATH RIVER.—Bids are being received for grading and bridge work on the extension of five miles across the Little River in California.

GARRETT, AUBURN & NORTHERN.—This company has been incorporated in Ohio, with a capital stock of $10,000, to build a railroad from Garrett, Ind., to Hamilton and Fish Lake. The incorporators are: Walter F. Booth, General Auditor Toledo, St. Louis & Western, Toledo, Ohio; F. S. Mitchell, Toledo, and E. B. Johns, of the *Toledo Blade*.

GRAND TRUNK.—Orders are reported issued for double tracking the line between Port Union and Pickering, Ont., work to be begun as soon as the weather will permit. Building is also to be begun on double tracking between Windsor and Port Erie.

HUMBOLDT.—This company, whose incorporation, as recently noted, took place in California on March 11, proposes to build from Eel River, near Dyersville, Humboldt County, north 135 miles through Eureka and Arcata to Crescent City, with branches along Van Duzen River, 10 miles; through the town of Ferndale west and north to the south end of Humboldt Bay, 15 miles; south and east along Eel River, 10 miles; from the main line near Arcata southwest along the head of Humboldt Bay, through Samoa and Fair Haven, 12 miles; from the main line near Mad River, east along the river and its north fork, 16 miles; along Little River east, seven miles; north along Luffenholz Creek, five miles; southeast along Maple Creek, seven miles; southeast along Redwood Creek, 10 miles. The incorporators are: A. B. Hammond, San Francisco; G. W. Fenwick, H. L. Walden and M. J. Ward, Eureka, Cal.; W. G. Gosslin, Portland, Ore. (March 29, p. 230.)

INTERNATIONAL & GREAT NORTHERN.—The company is reported relaying its track between San Antonio, Tex., and Austin, with 75-lb. rails.

KANSAS CITY, MEXICO & ORIENT.—Contracts are reported let for building the section from San Angelo, Tex., southeast about 500 miles to Chihuahua, Mex. The road will cross the Rio Grande over a bridge at Presidio del Norte. (Construction Supplement, March 8, 1901.)

KENTWOOD & EASTERN.—Geo. Y. Andrews, of Dillon, Miss., is reported to have the contract for building seven miles of this company's road in Louisiana. E. D. Preston, of Kentwood, La., is General Superintendent.

KLONDIKE MINES.—According to report from Dawson, building will be begun soon on this proposed line, which is to form a belt tapping the principal creeks of the district, and including Klondike City. The main office is Ottawa, Ill. (Construction Supplement, March 8, 1901.)

LAKE CHARLES & RICE BELT.—Preliminary surveys are reported completed, and the grading is to be begun soon for this new line in Louisiana from Lake Charles east about 200 miles via Abbeville to New Orleans. C. A. Lowery, of Lowery, is President, and A. V. Eastman, of Lake Charles, General Manager. (Construction Supplement, March 8, 1901.)

LONG ISLAND.—The Wagner bill has become a law, providing for the depression of the tracks of the Long Island on Atlantic avenue, Brooklyn. By the terms of the bill, the improvements will cover a distance of 30,525 ft., from Fort Green place to the city line. The depression will begin at Flatbush avenue station, 8 ft. below the street line, from which point there will be a depression for 6,700 ft., the depression to be covered by girders and masonry arches, restoring the street for public use to its full width. From Bedford avenue the tracks will rise rapidly in an open cut and will pass on to an elevated structure, which, at Nostrand avenue, will be of sufficient width for street traffic. This elevated structure will terminate at Ralph and Howard avenues, whence the tracks will be carried by tunnel 2,910 ft. to Stone avenue and thence by open cut to the present grade at Sackman street. At Manhattan crossing in the Twenty-sixth Ward, the present grade will be maintained, but there will be a rise from Snedeker avenue, one block east, to an elevated structure which will extend to Atkins avenue, from which point the tracks will return to the surface grade. The act provides that the city shall pay $1,250,000 toward the cost of the changes. Building is to begin at once, according to report. (Construction Supplement, March 8, 1901.)

MANCHESTER & ONEIDA.—This company has been incorporated in Iowa by capitalists of Manchester to build a railroad 10 miles long connecting the two cities.

Grading is to be resumed this week on the above line under the Manchester Construction Co., contractor. The contractors have already contracted with the Chicago Great Western for 300 tons of rail to be delivered at Oneida June 1, and the intention is to have the road completed by July 1. (Construction Supplement, March 8, 1901.)

MANITOULIN & NORTH SHORE.—Premier Ross, of Ontario, has introduced a bill into the Provincial Legislature to subsidize this proposed line with a grant of 2,542,000 acres of land. The road is projected from the terminus of the Grand Trunk at Meaford, to run northwest through Owen Sound, Wiarton and the Bruce Peninsula to a harbor near Tobermory. Thence trains will be run by ferry north 15 miles to Fitzwilliam Island, and thence by another section of the road across Manitoulin Island and to the mainland, and northwest toward a connection with the Algoma Central, with a spur to Sudbury. The Dominion Government has already granted a subsidy of $3,200 per mile, and building is in progress from Sudbury southwest. (Construction Supplement, March 8, 1901.)

MEXICO, CUERNAVACA & PACIFIC.—E. H. R. Green, President of the Texas Midland, has returned from a trip to Mexico in behalf of his mother, Mrs. Hetty Green, to inspect the completed portion of the M., C. & P. It is understood that Mrs. Green will supply the funds to complete that line. (Construction Supplement, March 8, 1901.)

MISCELLANEOUS COMPANIES.—The Eastern Construction Co. of New Haven, Conn., has been incorporated in that State, with a capital stock of $100,000, to build and equip steam and street railroads and do other construction work. The directors are: D. A. Blakeslee, F. C. Boyd, John S. Bradley, W. M. Anthony and D. W Blakeslee.

The Northern Equipment Co., of New York City, was incorporated in Delaware, April 9, with a capital stock of $2,500,000, to build and equip railroads.

MISSISSIPPI SOUND & NORTHERN.—Application is to be made soon for the incorporation of this company in Louisiana, with a capital stock of $100,000, for a line to run from Ansley, on the Louisville & Nashville, northeast to Pearlington, and ultimately to Columbia, to connect with the Gulf & Ship Island. M. E. Ansley is President; H. Dudley Coleman, First Vice-President, and C. D. Stuart, Secretary and Treasurer.

MISSOURI PACIFIC.—Building is reported begun at Boonville, Mo., on the cut-off from Boonville southeast about 40 miles to Jefferson City. John H. Reynolds has the contract. (Construction Supplement, March 8, 1901.)

MORGANTOWN & KINGWOOD.—Building is reported resumed on this line from Morgantown, W. Va., to Kingwood, 26 miles. Twelve miles of track is laid. Geo. C. Sturgiss, of Morgantown, is President. (Construction Supplement, March 8, 1901.)

NEVADA COUNTY TRACTION.—This company was incorporated in California, March 27, with a capital stock of $100,000, to build an electric line from Grass Valley to Nevada City, six miles. The incorporators are: John Martin, San Francisco; Eugene V. de Sabla, Jr., and R. M. Hotaling, San Francisco; R. R. Colgate, New York City.

NEW ORLEANS, NATCHEZ & ARKANSAS.—Howard Cole, of Vicksburg, Miss., Secretary of this company, is reported as stating that the company has obtained sufficient capital to build and equip the line, and that surveys will be begun at an early date. The road is projected from Vidalia, La., to East Providence, 100 miles. (March 22, p. 209.)

NEW YORK & PORT CHESTER.—This company was incorporated in New York April 3, with a capital stock of $250,000, to build an electric road 25 miles long from the Harlem River at Port Morris northeast through Mount Vernon, Pelham Manor, New Rochelle, Larchmont, Orienta, Mamaroneck, Milton, Rye and Port Chester to the Connecticut line, with a branch to Clason's Point, on the East River. The incorporators are: Charles Heinecke, of Whitestone; M. F. Germond, of Dumont, N. J.; W. H. Heath, of Brooklyn; M. W. Baldwin, E. D. Mailloux, Mesmore Kendall, Christopher Kaiser, C. O. Mailloux, of New York city, and Ernest Muller, of Westfield, N. J.

NORTHERN OHIO VALLEY TRACTION.—Building was reported begun, on April 3, according to report, on this proposed electric line from Wheeling, W. Va., north 16 miles to Wellsburg. Howard Hazlett is President, and Robert

Hazlett, Chief Engineer, both of Wheeling, W. Va. (Construction Supplement, March 8, 1901.)

Northern Pacific.—Extensive improvements are reported proposed on the branch line between Helena and Marysville, Mont.

Ontario Roads.—The Government propositions for aid to railroads have been handed down to the Ontario Legislature, calling for subsidies as follows:

(1) Bracebridge & Trading, from the town of Bracebridge to Baysville, in the district of Muskoka, not exceeding 16 miles, $49,000.

(2) Bruce Mines & Algoma, from Bruce Mines to Rock Lake copper mines, in the district of Algoma, not exceeding 13 miles, $39,000.

(3) To a railroad in the township of Osa to the iron mines in the township of Lanark, not exceeding 25 miles, $75,000.

(4) Norwood & Apsley, from Norwood on the Canadian Pacific to Apsley, in the county of Peterborough, not exceeding 25 miles, $75,000.

(5) Port Arthur & St. Joe, from Port Arthur northeast toward Lake Nepigon, in the district of Algoma, not exceeding 30 miles, a cash subsidy of $2,000 a mile, and a land grant of 5,000 acres per mile.

Oregon Short Line.—Building is reported begun on the Utah, Nevada & California line of the Utah & Pacific, which road has just been taken over by the O. S. L. The intention is, so it is stated, to build across Nevada to a connection with the Southern Pacific. (See Railroad News column.)

Pennsylvania.—The B. M. & J. F. Shanley Co., of Newark, N. J., has taken the contract for a half mile of the proposed elevated tracks of the Pennsylvania through that city. (April 5, p. 246.)

Pennsylvania Roads.—A syndicate represented by Geo. Q. Horwitz, of Philadelphia, attorney, has made application for charters for about 100 miles of trolley line within a radius of 35 miles from Philadelphia. Among his associates are Albert B. Kelly, Samuel A. Boyle, Jr., Wm. Innes Forbes and Dr. Orville Horwitz, his brother. The companies so far chartered are as follows:

Philadelphia, Norristown & Phœnixville, from the county line at Bala, north on the west and south banks of the Schuylkill River, through West Manayunk, West Conshohocken, Bridgeport and thence continue to Phœnixville.

West Chester & Wilmington, from West Chester over the Wilmington turnpike to the state line, with a branch from Painter's Crossroads to Media.

Philadelphia, Wayne & West Chester, from West Chester over a public road and on a purchased right of way to Wayne; thence partially on the Conestoga road and a purchased right of way to the county line in West Philadelphia.

Coatesville, Downingtown & West Chester Road, from West Chester to Marshallton, thence up the east branch of the Brandywine Creek to Downingtown; thence by turnpike to Coatesville, with a branch from Marshallton along the Strasburg road to Coatesville.

Parkesburg & Coatesville, along the Valley road, through the township of Valley, from Parkesburg to West Chester.

Chester, Wayne & Norristown, from the City of Chester to Media by the Providence road; thence to Newtown Square by the Newtown road and thence via Wayne and King of Prussia by the Radnor street road, and to Norristown.

Philadelphia, Media & Wilmington, from the west end of the bridge crossing the Schuylkill River, the city line above the falls of the Schuylkill to extend west on the city line road to Bala, Overbrook, Haverford Mills, Marple, Media and Lenni to the city of Wilmington, Del.

Pere Marquette.—The Commissioner of Railroads has approved of maps for a spur track on Twelfth and Adams streets, Bay City. See also Railroad News column.

Pittsburgh, Toledo & Western.—This company was incorporated in Ohio April 3, with a capital stock of $1,000,000, to build a steam railroad from a point on the Ohio River near Mingo Junction northwest to Toledo. The incorporators are: J. W. Patterson, of Pittsburgh, Pa.; N. P. Ramsey, A. B. Ridgeway and A. G. Feight, of Dayton, Ohio, and V. C. Winston, of St. Louis.

Plant System.—An officer writes that surveys are partly made for the proposed cut-off about 52 miles on the Savannah, Florida & Western, from Jesup, Ga., to Folkston. (March 29, p. 230.)

Reading, Birdsboro & Pottstown.—This company was incorporated in Pennsylvania, April 5, with a capital stock of $10,000, to build from Reading to Gibraltar, Berkes County, five miles. R. J. Purcell, of Atlantic City, N. J., is President.

Rio Grande Western.—Surveys are reported made for an extension from Marysvale, Utah, south 135 miles via Junction City, Circle Valley, Fremont Pass, Paragoonah, Parowan, Cedar and Valley to Iron City Summit.

Rockville, Broad Brook & East Windsor Street.—Application is made to the Connecticut Legislature for incorporating this trolley line to connect the cities named. Among those interested are George M. Merrill, of Springfield, Mass.; Clayton Harwood, Rockville, and John Fisk, Attorney.

Santa Fe & Grand Canyon.—The Atchison, Topeka & Santa Fe, which is operating this line, is reported as intending to immediately complete the 10 miles necessary to extend the road to the Grand Canyon. (Construction Supplement, March 8, 1901.)

Savannah Union Station.—W. J. Oliver & Co., of Langley, S. C., have been awarded the contract for grading and masonry on the yards and approaches to the union station, which is to be used jointly by the Seaboard Air Line, Plant System and the Southern. T. S. Tutwiler, of Savannah, Ga., is Engineer. (March 29, p. 230.)

Southern.—Surveys are reported in progress in Burke and McDowell counties, North Carolina, for reducing grades and straightening curves.

Southern Missouri & Arkansas.—K. H. Killebrew & Co., of Mt. Pleasant, Tenn., have the contract for building the extension from Mingo, Mo., southwest 15½ miles to Poplar Bluff. (Construction Supplement, March 8, 1901.)

Texas Southern.—The city of Marshall, Tex., has been asked to give $10,000 and right of way from Teneha, for an extension of its line southeast about 50 miles to that city.

Timpson Northwestern.—Surveys are completed and building begun on this line from Timpson, Tex., to Ragley, Hanover County. It is to be ultimately extended to Henderson, 32 miles from Timpson. W. G. Ragley, of Timpson, Tex., is President, and A. H. Schluter, Vice-President.

Toledo & Findlay Traction.—This company was incorporated in Ohio, April 6, with a capital stock of $1,500,000, to build an electric line from Toledo south to Findlay. Among the incorporators are George S. and G. B. Kerper, and Henry Burkhold, all of Cincinnati. (See Toledo & Southern Interurban.)

Toledo & Southern Interurban.—Colonel George B. Kerper, General Manager of the People's Street Railway of Dayton, Ohio, and President of the Findlay Street Railway, is reported to be making arrangements for a trolley line from Toledo south to Findlay, with the intention of ultimately extending it to Dayton and Cincinnati.

Trans-Appalachian.—Grading is reported begun on this proposed line from Butler, Tenn., on the Virginia & Southwestern, to Watauga, N. C. The company was incorporated some years ago, with L. H. Miller, of Washington, D. C., and W. E. Walton, of Morgantown, among the incorporators.

Union Pacific.—Preparations are being made, according to report, for improvements along the line between Junction City, Kan., and Ellis.

Contracts are reported let for widening 20 miles of roadbed on the main line of the Wyoming Division.

Other contracts are to be let for similar work on the Seventh District, including the widening of the roadbed between Rock Springs and Green River, Wyo., and between Bryan and Granger, 12 miles.

Union Springs & Northern.—Surveys are completed from Union Springs, Ala., to Fort Davis, 6½ miles, and the line is under survey from Fort Davis to Cohees, four miles. Contracts will be let at once and the company expects to begin building April 20. The road is projected from Union Springs, Ala., north via Fort Davis to Tuskegee, 20 miles. W. M. Blount, of Union Springs, is President and General Manager. (March 29, p. 230.)

Virginia & Southwestern.—An officer writes that there is no foundation in the report of an extension from Clinchport to St. Paul, Va. As to the proposed extension from Maymead to Mountain City, Tenn., the matter is under consideration, and a survey has been made but building is not definitely determined. (March 29, p. 230.)

Washington & Oregon.—Edmund Rice, Jr., Secretary and General Manager, is reported as saying that the company expects to ask for bids, on April 15, for completing this proposed line from Portland, Ore., north to Tacoma & Seattle. (March 22, p. 210.)

Washington & Seaboard.—Kearns & Egan are reported to have taken the contract for building this proposed line from Washington, D. C., south 80 miles via Brandywine, Md., Mechanicsburg, and California to Point Lookout, with branches from California to Drum Head Bay, three miles, and from Hollywood to St Mary's Bay, six miles. The main line is to be ready for equipment by April 1, 1902. A. B. Linderman is President, and Wm. A. Hoffman, Secretary and Treasurer, both of Lippincott Bldg., Philadelphia. (Construction Supplement, March 8, 1901.)

Washington-Baltimore Electric.—A syndicate of Cleveland and Akron capitalists, headed by Lamprecht Bros. & Co., F. N. Wilcox and James Christy, Jr., have organized this company with the reported purpose of building an electric road from Washington, D. C., to Baltimore, 33 miles, with a branch of 15 miles to Annapolis. The plan is to enter the District of Columbia and the city of Washington over the tracks of the Washington Traction & Electric.

Western Maryland.—See Railroad News column.

Wheeling & Lake Erie.—See Railroad News column.

GENERAL RAILROAD NEWS.

Buffalo & Susquehanna.—Of the $3,500,000 first mortgage refunding 50-year 4 per cent. gold bonds which the company has contracted to sell to Fisk & Robinson, $1,000,000 is to be reserved to retire outstanding 5s which mature about July, 1906, and the remainder is to be used for acquiring 56 miles of railroad before held under lease, and for an extension of the main line, about 17 miles long, recently built; also for additional equipment and the control of the Clearfield Bituminous Coal Co. Holders of the old bonds may arrange to exchange for new with Fisk & Robinson. (March 22, p. 210.)

Chicago Great Western.—The security holders of this company have unanimously authorized the issue of $2,500,000 additional 4 per cent. debenture stock. (Nov. 9, 1900, p. 748.)

Colfax Northern.—See Railroad Construction column.

Colorado Springs & Cripple Creek District.—This company, which is building a line from Colorado Springs, Colo., west 44 miles to Cripple Creek, with branches from Cameron to Victor, 6.5 miles, and from Cripple Creek to Victor, five miles, has made a second mortgage to the International Trust Co. of Denver, as trustee, to secure $1,000,000 20-year 5 per cent. gold bonds, dated April 1, 1901, of which $900,000 have been sold. The company has previously issued also $2,000,000 first mortgage bonds, due 1930. (Construction Supplement, March 8, 1901.)

Columbus, Sandusky & Hocking.—The United States Circuit Court of Appeals at Cincinnati, Ohio, on April 2 extended the order of Judge Taft, made in March, 1900, directing the sale of the property. The higher court sustained Judge Taft's opinion that the lien of the $500,000 Monserrat receivers' certificates is limited to their claim on $800,000 of the prior lien bonds deposited with the Crawford County Court and on certain other property whose value is unascertained. The claims prior to the general mortgage are said to aggregate $3,750,000. Other minor questions are to be decided before the sale can take place. (March 23, 1900, p. 194.)

Cornwall & Lebanon.—Six car trust certificates of $1,000 each have been drawn for payment at the office of the Pennsylvania Co. for Insurance on Lives and Granting Annuities, in Philadelphia, on April 1, interest ceasing from that date. (Oct. 5, 1900, p. 662.)

Deckerville, Osceola & Northern.—The Kansas City, Fort Scott & Memphis has obtained control of this property, which extends from Deckerville, Ark., to Luxora, 38 miles. It is to be operated as the Osceola branch.

Detroit & Lima Northern.—A sale of this property is to take place at Lima, Ohio, May 23, at 2 p. m. (April 5, p. 246.)

Eagles' Mere.—The Williamsport & North Branch has taken a 99-year lease of this property, which extends from Eagles' Mere, Pa., to Snoestown, and will make it standard gage.

Kansas City, Memphis & Birmingham.—Seventeen first mortgage 5 per cent. bonds of 1897 have been called for payment at 110 and interest, on April 13, at the Treasurer's office, Boston.

Metropolitan West Side Elevated (Chicago).—Extension bonds to the amount of $5,000,000 were authorized by the stockholders April 8. They will bear interest at 5 per cent. from Feb. 1, 1901, and run until Aug. 1, 1938. The new bonds are to be a first lien on proposed extensions. (Construction Supplement, March 8, 1901.)

Memphis & Charleston.—Simon Rothschild, a stockholder of this company, filed a plea in the U. S. Circuit Court of Appeals at Cincinnati, Ohio, April 8, against this company and the Southern Ry., asking for a receiver and an accounting of the M. & C. He also asks that the Southern be held to have no right or title in the M. & C., and be enjoined from any possession under the sale of 1898. (Nov. 24, 1899, p. 820.)

New York, New Haven & Hartford.—The $300,000 New York, Providence & Boston 4 per cent. bonds, maturing April 1, have been paid by the company. The Nantasket Beach bonds will not be paid at present and probably not before 1908, when the Old Colony, as lessee, has the option of buying the property. Interest on these bonds will be paid by the Treasurer of the Old Colony at Boston.

Pere Marquette.—The company has issued a mortgage to the Farmers' Loan & Trust Co., as trustee, to secure $50,000,000 4 per cent. 50-year bonds. Of this issue $26,738,887 is reserved to cover all outstanding indebtedness. A portion will be sold for the extensive improvements now being made and the remainder will be held for future requirements. It is said that the company will expend this year $2,000,000 in cutting down grades, straightening the line, buying new rail and rolling stock, and for a car ferry being built at Cleveland to cost $350,000.

St. Clair, Madison & St. Louis Belt.—This company has been reorganized without foreclosure, in accordance with the plan of Jan. 2. There is an issue of $800,000 new 4 per cent. gold bonds, dated Jan. 1, 1901, subject to call at 105 after five years. (Feb. 15, p. 120.)

St. Louis & San Francisco.—J. & W. Seligman & Co., New York, announce the completion of plans for creating a new general mortgage consisting of $85,000,000 50-year 4 per cent. bonds. Of this $62,500,000 will be used for refunding and the rest for extensions and improvements. The banking house has bought $30,000,000 of this issue, with an option on a like amount. The plan is said to have the assent of holders of $20,000,000 of the bonds. (Feb. 15, p. 120.)

Sioux City & Pacific.—This property is to be sold at public auction at the office of the Solicitor of the Treasury in Washington on June 20, to extinguish the Government's interest in the property. The upset price will be $1,872,000, subject to a prior lien of $1,628,000. Each bidder must deposit $100,000. (June 15, 1900, p. 408.)

Southern Missouri & Arkansas.—This company, successor to the St. Louis, Cape Girardeau & Fort Smith, has disposed of all its treasury bonds which frees the property from floating debt. There is now outstanding $600,000 first mortgage fixed interest 5s; $400,000 first mortgage 5s, with interest deferred until July, 1904. Bonds have been sold to the amount of $200,000 to provide for the extension from Mingo to Poplar Bluff, now building and to be completed Sept. 1. (Nov. 2, 1900, p. 732.)

Spokane Union Depot.—This company has been organized at Spokane, Wash., to take over the union depot and terminals of the Oregon Railroad & Navigation and the Union Pacific. It is stated that the property will continue under the administration of H. M. Adams, General Agent of the O. R. & N.

Texas & New Orleans.—The Atlantic Trust Co., trustee, New York, calls for bids up to noon, April 13, for first mortgage bonds at 110 and interest, to absorb $80,000. (Feb. 1, p. 88.)

Utah & Pacific.—The Oregon Short Line has bought this line, which extends from Milford, Utah, southwest 75 miles to Uvada, preparatory to its extension on southwest across Nevada toward San Francisco. (See Railroad Construction column.)

Western Maryland.—The directors, on April 3, authorized the immediate expenditure of about $336,000, to increase the facilities of the western portion of the line for handling business in connection with the Philadelphia & Reading. It is proposed to issue $350,000 bonds on the Potomac Valley R. R. of West Virginia, the Potomac Valley R. R. of Maryland, and on the Franklin line from Phillipsport to Shippensburg. Funds received from these bonds will be used to build additional track from Williamsport to Cherry Run, and from Williamsport to Shippensburg, and to rebuild bridges and replace the present 56-lb. rails with 85-lb. steel.

Wheeling & Lake Erie.—Russell Sage is reported as confirming the statement that the Gould interests have bought this road. The main line runs from Toledo southwest 217 miles to Martins Ferry, with a cross line from Cleveland south 14 miles to Zanesville, a cross line from Cleveland south 145 miles to Zanesville, crossing the main line at Navarre. Branches bring the total mileage up to 465. The capital stock in July, 1899, was increased from $24,500,000 to $37,000,000. It is now divided into $5,000,000 first preferred, $12,000,000 second preferred and $20,000,000 common. There is an authorized issue of $15,000,000 4 per cent. 50-year consolidated bonds, dated Sept. 1, 1900. Mr. Sage is quoted as intimating that extensions will be built or acquired to the Atlantic coast.

The stockholders, on May 1, will vote on the proposition to buy or lease the Adena Railroad, and the Zanesville (Ohio) Belt & Terminal; also build a branch from Fuller's Station in Carroll County, Ohio, to Craig's stone quarry, and to lease or acquire the property of the Huron Dock Co. The Zanesville Belt & Terminal and the Adena were both recently incorporated. (See Adena in Railroad Construction column, March 15, p. 194.)